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Guidance Manual for FY 1988 - FY 1989

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The purpose of developing national air audit system guidelines is to establish standardized criteria for EPA Regions to follow when auditing State air program activities. This document, prepared jointly by the State and Territorial Air Pollution Program Administrators (STAPPA), the Association of Local Air Pollution Control Officials (ALAPCO), and the Environmental Protection Agency, provides national air audit guidelines for air quality planning and SIP activities, new source review, compliance assurance, air monitoring, and vehicle inspection and maintenance programs.

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National Air Audit System Guidance Manual for FY 1988 - FY 1989

Air Quality Management Division

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

February 1988

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1. INTRODUCTION

The National Air Audit System (NAAS) was first implemented in 1984 as a result of a joint STAPPA/ALAPCO and EPA effort. This FY 1988-1989 audit manual has been based on the FY 1986-1987 manual, but has been revised to include new emphases and to upgrade the quality of the audit effort over the last cycle.

In the past , EPA set forth overall policy for the NAAS, based on agreement with STAPPA/ALAPCO and the Regional Offices. The portions of that policy that will continue to apply this year, together with new emphases, follow:

- Program Coverage - Coverage will consist of the same five topics as before (air quality planning and SIP activities,[1] new source review, air monitoring, compliance assurance, and vehicle inspection/maintenance).
- Audit Teams - EPA Regional Offices will select the composition of the audit teams. A crossover team approach (State/local and outside Regional Office representatives) is possible for FY 1988-1989 if Regions and affected States so desire. All audit team members should have sufficient knowledge of the programs they audit; the audit is not intended as an on-the-job training program for inexperienced personnel. Also, as a minimum, middle or senior Regional management should personally participate in the exit interview with the agency director.
- Audit Coverage - As was the case last year, each of the four following audit topics should be covered at each State agency: (a) air quality planning and SIP activities; (b) new source review; (c) compliance assurance; and (d) air monitoring. Only those agencies with I/M programs that have been on-going for one year or more should be considered for I/M audits.
- On-site Visits and Pre-preparation - Regions should continue to conduct on-site audit visits, but should maximize use of telephone interviews and "on-hand" information to prepare for the visit and to complete significant portions of the questionnaire. Questionnaires should be exchanged and results studied and evaluated prior to each on-site visit.

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[1] The air quality planning and SIP activities chapter has been shortened and will only include emission inventory and diffusion modeling activities.

- Schedule - To even out audit workloads on the State and local agencies and the EPA auditors, STAPPA/ALAPCO and EPA agreed that the NAAS effort will be spread over two years. Each EPA Region will be responsible for ensuring that all State agencies and selected local agencies are audited within the two year period. It is recommended that approximately half the agencies are audited the first year and the remaining agencies the second. Regions may begin their FY 1988-1989 audit as early as they wish, so long as the audited agency is agreeable and the previous item ("On-site Visits and Pre-preparation") is accomplished prior to the on-site visit. The Regional Office must forward a final audit report to OAQPS within 180 days after the audit is completed.

- Corrective Actions - Actions to implement the needed improvements identified in the audits will be initiated through existing mechanisms, i.e., 105 grants, State/EPA agreements, etc.

- National Report - At the end of the two year audit cycle, the OAQPS will prepare a national report based upon the results of all Regional audits. The national report will not rank agencies or focus on deficiencies of specific agencies. Before they are finally issued, drafts of the national report will be reviewed by EPA Regions and representatives of STAPPA and ALAPCO.

- Replacement for Other Audits - The NAAS has replaced Regional Office audit activities carried out previous to initiation of the NAAS. It does not, however, replace all portions of the 105 grant evaluations that are specified in the grant regulations.

- Other Oversight - The NAAS is intended to eliminate the need for much of the "item by item" Regional Office oversight on certain State and local agency programs. The NAAS, however, will not be a substitute for the necessary flow of communications between State/local agencies and EPA Regional Offices.

GOALS AND OBJECTIVES OF THE NATIONAL AIR AUDIT SYSTEM

The purpose of developing a national audit manual is to establish standardized criteria for the EPA Regions' audit of State and local air program activities. The primary goals of this program are to determine the obstacles (if any) which are preventing the State or local air pollution control agencies from being as effective as possible in their air quality management efforts and to provide EPA with quantitative information on how to define more effective and meaningful national programs. States are playing a larger role than ever in the planning and implementation of complex, and often controversial, air pollution control strategies. EPA oversight of these and related activities is necessary for ensuring national consistency and for assisting the States in resolving identified problems.

The EPA and States can also use these audit results to ensure that available resources are being focused toward identified needs (e.g., attainment and maintenance of standards, adoption of regulations, implementation of regulations and technical analyses to support control strategy development).

The EPA also hopes to share the results of these audits in a manner that permits the "cross-fertilization" of innovative approaches and systems across States and Regions. Only through this national exchange can we hope to benefit from the invaluable experiences gained to date by control agencies in carrying out the requirements of the Clean Air Act.

This audit guideline outlines a program which EPA, State, and local air pollution control agencies can jointly use to--

- Meet statutory requirements;
- Assist in developing at least a minimally acceptable level of program quality;
- Allow an accounting to be made to the Congress and the public of the achievements and needs of air pollution control programs;
- Enable EPA, States, and local agencies to agree on needed technical support and areas where program improvements (including regulatory reform) should be made; this includes improvements to both EPA and State/local programs;
- Maximize and effectively manage available resources within the State and local agencies and EPA, resulting in expeditious attainment and maintenance of ambient air quality standards as soon as possible; and
- Promote a better understanding of the problems facing air pollution control agencies, thereby fostering mutual respect among EPA, State, and local agency staff.

State, local, and EPA Regional Offices, working together, may identify items in addition to those of the national program that are worthy of further audit attention. In identifying these, the EPA Regional Office and the State/local agency should understand in advance what the reasons are and what the objectives and expected result(s) of this expanded review will be. Also, the NAAS is not intended to preclude EPA Regions from dealing, on a case-by-case basis, with significant deficiencies which are identified during the course of the audit.

The EPA, State, and local agencies should keep in mind that the audit is intended to improve the overall quality of air pollution control programs. This intent of improving overall performance needs to be clearly understood. The standards of performance outlined by these guidelines are not so rigid that they eliminate the flexibility afforded by the Clean Air Act. Also, these guidelines should not be construed to establish performance standards which must absolutely be achieved in practice. Moreover, while participating agencies will use the audit to point out where opportunities exist for State or local improvements, it is not expected that the audit will address every problem. The EPA, however, will continuously search for and disseminate information about better ways of consistently, effectively, and efficiently implementing a comprehensive air pollution control program. This includes possible reforms of EPA's requirements where feedback from the audits suggests that certain requirements detract from program effectiveness.

AUDIT PROTOCOL

Each Regional Office must tailor the structure of the audit according to the particular characteristics of the State and local agencies in the Region and its own operating procedures. Certain elements and procedural steps, however, appear necessary or useful in FY 1988-1989 based on previous experience. These are discussed below.

Advance Preparation

The EPA should send a letter to the control agency well in advance of the audit. The letter should confirm the date and time of the audit and describe what resources the State is expected to provide, such as office space and staff time. This letter should also identify the name and title of each EPA individual who will participate in the audit.

With the exception of file audits and similar questionnaires, the EPA Region will provide the control agency with the nationally prepared questionnaire. These should be sent to the State or local agency 6 weeks in advance of the audit and, thus, will allow the agency to better prepare for the audit. The State or local agency should fill out the specified parts of the questionnaires and return a copy of the completed questionnaire to the Regional Office 2 weeks before the on-site visit. The Regional Office subject experts should review the completed questionnaire and use it to prepare the audit team for the on-site visit. Returning the completed questionnaire to the Regional Office before the visit should serve to minimize wasted effort and time reviewing the questionnaire during the on-site visit and to prepare the audit team for discussions that focus on any problems uncovered in the questionnaire. Because of time limitations, however, it may not be possible in all cases to return the completed questionnaire to the Regional Office before the on-site visit; in these cases, the State or local agency will have to make the completed questionnaires available to the audit team during the on-site visit.

The chapter for each of the audit topics presents the specific protocol for that audit topic. This includes procedures such as advance tailoring of the questionnaires for the air quality planning and SIP activities audit, selection of files for new source review audits, and instructions for use of the individual questionnaires.

On-site Visit

The primary purposes of the on-site visit are to--

- engage in a broad discussion with agency staff to gain insight into any recent changes in the structure of the organization, discuss specific problem areas of the agency, and become acquainted with the staff in order to better open up channels of communication;
- discuss and clarify answers to the questionnaire and complete any questions not answered by the audited agency;
- review on-site documents that are too cumbersome to transmit such as permits, modeling runs, and supporting files; and
- audit by observing the agency's daily operations of programs for air monitoring, compliance assurance, new source review, planning and SIP activities, and (where appropriate) vehicle inspection and maintenance.

Typically, the on-site audit is conducted in four phases:

- The EPA auditors for all programs meet with the State agency director and top staff to discuss the goals of the audit and to "break the ice." This meeting usually sets a cooperative tone for the visit.
- The EPA auditors conduct a discussion of the questionnaire with the person(s) in charge of each of the activities to be audited.
- The EPA auditors will review appropriate files; this will usually be necessary for each of the five audit areas to varying extents.
- The exit interview is held as a wrap-up session to inform agency management of the preliminary results of the audit. This promotes harmony between EPA and the State by giving immediate feedback of the results in a face-to-face meeting between the people actually performing the audit and those responsible for the programs being audited. The EPA middle or upper management from the Regional Office should participate in at least this portion of the on-site visit.

The time which the audit team spends to complete the various phases of the on-site visit should usually not exceed 3 days. This general rule, however, will be difficult to adhere to in certain instances, such as when satellite facilities of the agency must also be visited. In any event, the duration of the on-site visit should be mutually agreed upon in order not to create an undue burden to the agency being audited.

A recent survey of the Regions indicated that many Regions preferred to conduct the four or five parts of the audit separately rather than all at the same time as generally recommended in the above guidance. This decision is left to each Region, with the understanding that the States should be fully informed as to the intentions of the Region in this regard.

AUDIT REPORTS AND USE OF AUDIT DATA

Each State or local agency audit report should contain the findings for each of the four or five audited areas. The audit report must include a copy of the completed questionnaire(s) (except file audit or similar questionnaires--see specific instructions in appropriate chapters of this manual) for each of the audit topics to enable national compilation of audit results. Since the questionnaires will be included, the audit report should not merely reiterate the answers on the questionnaires, but present the Regional Office's overall findings. The Region should give the State or local agency an opportunity to comment on a draft of the report before it is released outside of EPA. This allows misunderstandings and errors to be discovered before the report is made final.

The audit report should contain an executive summary that provides the Regional Office's overall assessment of the audited agency's program after reviewing all the questions as a whole.

Major deficiencies identified during the audit should also be highlighted in the executive summary. This enables the Region to detail all the findings of the audit without causing the reader to confuse minor points with major problems. It also identifies to the audited agency those deficiencies considered most serious.

Where an agency disagrees with the conclusions of the audit, it should provide to EPA written comments outlining its perspective. These will be incorporated as an appendix into the final report. The report should also highlight outstanding and/or innovative program procedures that are identified.

The audit would be of limited use without some mechanism for rectifying identified deficiencies. Therefore, it is important that the report recommend measures or steps to treat the causes determined to be responsible for these inadequacies. Lead agencies responsible for implementing these recommendations and anticipated resource requirements should also be considered.

Each question should be answered on the questionnaire itself; attachments should be avoided unless a question specifically requests them. If attachments are requested and included, the attachments should be forwarded to OAQPS along with the questionnaire.

A recommended format for preparation of the audit report is given in Table I-1. Following a standardized format will not only enable reviewers to easily find material in the text, but will also facilitate compilation of information into the national report.

A national report compiling the findings of the audits conducted by the EPA Regions will be prepared by EPA Headquarters. This analysis will be based on the reports prepared by the EPA Regions discussed above. It will not rank agencies or focus on specific deficiencies in individual programs. While it will address areas of conflict between EPA guidance and action of implementation experience, it will not be a forum for addressing unresolved issues between audited agencies and States.

The NAAS initiative is designed as a partnership effort to help EPA and State and local agencies each do their respective jobs better. It is our hope that it can become the foundation which all involved can use to make solid progress in protecting and enhancing the quality of our Nation's air.

Table I-1

RECOMMENDED FORMAT FOR AUDIT REPORTS

Introduction--Purpose of audit, for benefit of potential layman readers; identify persons on EPA audit team and persons interviewed in audit visit.

Executive Summary--Outline major findings, major deficiencies, and major recommendations. As the name implies, it is a summary designed for the chief executive--the director--of the audited agency. The summary should cover all audit topics:

Air Quality Planning and SIP Activities
New Source Review
Compliance Assurance
Air Monitoring
Vehicle Inspection and Maintenance (where audit is conducted)

Air Quality Planning and SIP Activities--Follow recommended format in Chapter II of Audit Manual

New Source Review--Follow recommended format in Chapter III of Audit Manual

Compliance Assurance--Follow recommended format in Chapter IV of Audit Manual

Air Monitoring--Follow recommended format in Chapter V of Audit Manual

Vehicle Inspection and Maintenance--Follow recommended format in Chapter VI of Audit Manual

Appendices

Completed Air Quality Planning and SIP Activities Questionnaire
Completed New Source Review Questionnaires (except for permit file questionnaire)
Completed Compliance Assurance Questionnaire
Completed Air Monitoring Questionnaire
Completed Vehicle Inspection and Maintenance Questionnaire (where audit is conducted)
Audited Agency's comments on draft report (for final report)

Chapter 2

AIR QUALITY PLANNING AND SIP ACTIVITIES GUIDELINES

FY 1988-1989

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2. AIR QUALITY PLANNING AND SIP ACTIVITY

INTRODUCTION

The FY 1988-1989 audit guidance for air quality planning and SIP activity has been revised from the guidance used in FY 1986-1987. Two sections were removed from the chapter for this round of audits. The air quality evaluation section was removed because this baseline data has been collected for three audit cycles. SIP implementation questions were not included because the agencies will be involved in developing PM_{10} and ozone SIPs during the current audit cycle.

Many of the comments received on past guidance expressed concern that the Air Quality Planning and SIP Activity chapter was more of a survey questionnaire than an audit questionnaire. We are trying to make the transition to an audit type questionnaire. However, due to the impending need to get the FY 88-89 audit cycle underway, complete transition will not be possible until the upcoming FY 90-91 audit.

Audit criteria are provided below for each of the program areas to be audited. Each topic is prefaced by a brief discussion of what activities it encompasses and what we generally hope to accomplish through the audit.

PROTOCOL

Procedurally, the Regional Offices will, upon receiving this questionnaire from OAQPS fill in Section C.4.a on modeling analysis before sending it to the State and local agencies. These agencies will then complete the questionnaire and return it to the Regional Office at least 2 weeks before the on-site visit. Regional EPA staff would then review the State/local agency responses prior to the on-site audit. Regional Office auditors should discuss all questionnaire items with the appropriate agency personnel during the audit.

In compiling the data for the FY 1986-1987 national report, it was noted that a number of the questionnaires for the Air Quality Planning and SIP Activities chapter were incomplete. Whether or not the agencies return the questionnaire with all of the questions answered, the auditors must verify the answers provided and complete all parts of the questionnaire that are left blank. It should be remembered that this is an EPA audit of the agencies' programs; therefore, the answers in the questionnaire must reflect the findings of the auditors, even if the agencies are not in complete agreement with these answers. The differences are to be discussed with the agencies during the audit and between the issuance of the draft report and the final report. If the differences cannot be resolved, the agencies' comments are to be attached to the final report. The Regional Offices are expected to ensure the quality of the reports and see that all the questions are answered in the questionnaire.

The draft report from the Regional Office should consist of an overall executive summary and highlights of the emissions inventories and modeling sections. The questionnaire would then follow this narrative audit summary.

EMISSION INVENTORIES

The emission inventory provides information concerning source emissions and defines the location, magnitude, frequency, duration, and relative contribution of these emissions. An inventory is useful in designing air sampling networks, predicting ambient air quality, designing control strategies, and interpreting changes in monitored air quality data. Plans for attaining and maintaining NAAQS' are dependent on a complete and accurate emission inventory. The FY 1988-1989 guidance has focused on the major nonattainment problem of ozone by directing questions toward the completeness and quality of the agencies VOC emission inventories. In addition, questions on PM_{10} have been added to the questionnaire.

In the implementation of a nationwide program of air quality management, consistent methods of inventory compilation are essential. An adequate emissions inventory must be accurate, complete and up-to-date, and provide for consistency in planning between metropolitan areas, States, and Regions.

MODELING

Air quality models are being used more extensively in the conduct of day-to-day activities in the planning and SIP program area. These activities include such things as attainment demonstrations, major source compliance determinations, new source review, evaluations of "bubbles," and assessing attainment status. Most State agencies should have the EPA reference models on-line that are available for use in these and other types of applications. The modeling audit is intended to gather information regarding the agency's demonstrated expertise and capability to perform necessary air quality modeling analyses consistent with accepted EPA procedures.

This guidance reviews the various kinds of modeling applications performed or evaluated at the State/local program. Because the Region will have already reviewed certain site-specific modeling analyses which the State/local agency has submitted (such as bubbles, new source permits, etc.), the questionnaire asks the Regional Office to list the results of these evaluations.

B. Emission Inventories

B.1. Uses of Criteria Pollutant Emission Inventories

Emission inventories are used in a number of applications by air pollution control agencies, including the development of SIPs and the demonstration of reasonable further progress (RFP) in O_3 nonattainment areas. The following questions deal with the uses of emission inventories by your agency.

State/local agency response

a. Uses of Emission Inventories

Indicate below other uses that were made of your agency's criteria pollutant emission inventories in the past year, not necessarily just in nonattainment areas. (Check "x" where appropriate.)

	PM/PM_{10}	SO_2	NO_x	VOC	CO	Pb
1. Used for developing and evaluating areawide control strategies	___	___	___	___	___	___
2. Used as input to dispersion and other air quality models	___	___	___	___	___	___
3. Used to project possible areas of high pollutant concentrations to help place ambient monitors	___	___	___	___	___	___
4. Used for source permits or inspections, including for assessing permit, operating, and inspection fees	___	___	___	___	___	___
5. Used for responding to information requests	___	___	___	___	___	___
6. Used indirectly for general program planning	___	___	___	___	___	___

7. Other uses (specify) ____

____

b. Quality Assurance

Quality (or validity) assurance for emission inventories involves checks of the procedures, emission factors, calculations, etc., that were used during compilation as well as checks for missing sources and edit checks for reasonableness. Specify below the statement that best describes the quality assurance measures that are conducted on your State's emission inventories.

1. ___ Formal, rigorous, regular checks are implemented
2. ___ Less formal, spot checks are made, on an irregular basis
3. ___ No quality assurance measures are implemented

Are other efforts made to insure all existing sources are included in the inventory? (describe) ______

Are other efforts made to varify that source and emissions information is accurate and up-to-date? (describe) ______

c. What should EPA do to help you make your criteria pollutant inventories more comprehensive, accurate and current? (Check "x" where appropriate.)

	Very Important	Useful	Adequate As Is	No Strong Opinion
1. Provide better guidance on...				
-Point sources	___	___	___	___
-Area sources	___	___	___	___
-Highway vehicle	___	___	___	___
-Locating sources	___	___	___	___
-Questionnaire design	___	___	___	___
-Quality assurance	___	___	___	___
-Data handling	___	___	___	___
-Reflecting SIP regs in projection inventory	___	___	___	___

-Other(specify) ______

	Very Important	Useful	Adequate As Is	No Strong Opinion
2. Improve emission factors in AP-42	___	___	___	___
3. Provide computerized systems having better data handling capabilities	___	___	___	___

4. Other(specify) ____

____

d. Do agency personnel engaged in emission inventory development have or have access to all current guidance on emission factors and emission inventory preparation? (RO personnel performing the audit should obtain a current listing of existing guidance from the Criteria Emissions Section at OAQPS prior to the audit. It should be used as a checklist on this question in conducting the audit).

EPA Regional Office Response (Confirmation or Comment) ________________

____

____

B.2. VOC Inventories in O_3 Nonattainment Areas

Current guidance requires that VOC inventories in O_3 nonattainment areas be adjusted in various ways to reflect reactive emissions occurring during the O_3 season. The following questions address the adjustments made in your agency's VOC inventory and apply to all components of the inventory, i.e., point, area and highway vehicle sources. (NOTE: if your state contains no nonattainment areas for O_3, check here [___] and go to B.3.)

State/local agency response

a. EPA guidance specifies that methane, ethane, methylene chloride, methyl chloroform, trifluoromethane and 6 chlorofluorocarbons should be excluded from O_3 SIP inventories as nonreactive. Indicate below your agency's exclusion of nonreactive VOC compounds from its O_3 SIP inventory. (Check "x" where appropriate.)

1. ___ No VOC compounds have been excluded as nonreactive (if checked, go to question b.)

Check the compounds that are excluded from the O_3 SIP as nonreactive.

2. ___ Methane
3. ___ Ethane
4. ___ Methylene chloride
5. ___ Methyl chloroform
6. ___ Trifluoromethane
7. ___ Chlorofluorocarbons CFC-11, CFC-12, CFC-22, CFC-113, CFC-114, CFC-115
8. ___ Others - specify compounds ______________________________
____
9. ___ The agency excludes the following compounds based on vapor pressure cutpoints: ______________________________
____

b. What technical basis does your agency use to identify and quantify nonreactive VOC? (Check "x" where appropriate.)

1. ___ Nonreactive VOC not excluded, so question not applicable
2. ___ Use EPA's VOC Species Data Manual, as revised 1988.
3. ___ Use MOBILE4 option to generate nonmethane VOC emission factors for highway vehicles.
4. ___ Use general species profiles from the literature.
5. ___ Sources are asked to list nonreactive compounds in their VOC emissions.
6. ___ Vapor pressure cut point of ________.
7. ___ Other (specify) ______________________________

c. The highest levels of ozone formation generally occur on weekdays during the summer months. Current guidance requires that VOC inventories represent typical weekday emissions during the summer ozone season. Have your VOC totals been adjusted for conditions representative of the O_3 season such as higher temperatures, lower Reid Vapor Pressure (RVP) of gasoline, etc.?

1. ___ Yes ___ No

If yes, check the appropriate statement(s) below:

2. ___ Higher O_3 season temperatures have been considered in generating highway vehicle emission factors

3. ___ Higher O_3 season temperatures have been considered in estimating evaporative losses from petroleum product (including gasoline) storage and handling.

4. ___ Lower summertime RVP's have been considered in estimating evaporative losses from gasoline storage and handling

d. A number of source categories have recently been identified as being potentially significant VOC emitters that have not traditionally been included in VOC inventories, especially those relating to fugitive and/or waste treatment processes. Have the following sources been included in your agency's VOC inventory? (Specify "yes" or "no," or "N/A" if no such sources are located in your area.)

1. ___ POTW's (Publicly Owned Treatment Works, i.e., sewage treatment plants)

2. ___ TSDF's (Treatment, Storage and Disposal Facilities for hazardous wastes, including landfills, surface impoundments, waste piles, storage and treatment tanks, hazardous waste incinerators, and injection wells)

3. ___ Municipal landfills (domestic garbage, rubish, etc.)

4. ___ Fugitive leaks from valves, pump seals, flanges, compressors, sampling lines, etc., in organic chemical manufacturing facilities (esp. SOCMI)

5. ___ Leaks from underground gasoline storage tanks

e. In question B.1.d, we asked how EPA could help you on your criteria pollutant inventory. Indicate below where your agency specifically feels better information or guidance is needed to improve its VOC inventory. (Check "x" where appropriate.)

	Very Important	Useful	Current Data Or Guidance Adequate	No Strong Opinion
1. Excluding nonreactive VOC				
2. O_3 season adjustment of VOC totals				
3. Emission factors for sewage treatment plants and hazardous waste treatment, storage, and disposal facilities				
4. Other(specify)				

EPA Regional Office Response (Confirmation or Comment)

B.3. Demonstration of Reasonable Further Progress (RFP)

If your State contains no O_3 nonattainment areas, check here [___] and go to B.4.

State/Local Agency Response

a. For O_3 nonattainment areas, the Clean Air Act requires SIPs to provide for tracking of VOC emission reductions to ensure RFP. Through CY 1987 did your agency actually track changes in VOC emissions or emission reductions with projected changes in emissions or emission reductions given in the SIP RFP curves?[1] Check yes or no for each nonattainment area listed below. If no, insert the letter code best representing the reason RFP was not tracked.

Areas where O_3 RFP should be tracked: (Regional Office to provide list)	Yes	No	Reason (use codes)
1. ____________________	___	___	________
2. ____________________	___	___	________
3. ____________________	___	___	________
4. ____________________	___	___	________
5. ____________________	___	___	________

CODE

A. Alternative tracking mechanisms used (e.g., air quality data), not directly involving emission inventories.
B. RFP tracking not considered a priority task.
C. Insufficient resources available to track RFP by maintaining up-to-date emission inventory data.
D. Insufficient guidance available on how to do RFP tracking.
E. Other (specify)____

b. RFP Report: If "yes," did your agency, in the past year:

1. Prepare a report on RFP? ___ yes ___ no

2. Submit the report to EPA? ___ yes ___ no

3. Make the report available for public comment? ___ yes ___ no

---

[1] This question applies only to those areas specified by the Regional Office as O_3 extension areas and areas where EPA called for SIP revisions. (EPA Regional Offices can provide a list of these areas.) Note that RFP tracking means compiling a realistic estimate of an individual year's emissions or emission reductions and comparing this to the appropriate year in the SIP RFP curve. Merely compiling air quality data trends as an alternative to compiling emissions data is not accepted as RFP tracking.

For EPA Regional Office response

4. Has the RO received the above reports? ___ yes ___ no

5. If "yes," has the RO commented or otherwise responded to the State or local agency on the report? ___ yes ___ no

6. Are you assured that any progress indicated is the result of real emission reductions rather than the result of changes in methodologies, emission factors, etc.? ___ yes ___ no

c. RFP Emissions Inventory Update: For each of the areas where O_3 RFP should have been tracked in the past year, what approximate percent of the VOC emissions in the inventory was updated for the major, minor, and mobile source categories that year? The areas are the same as those listed by the Regional Office in question a.

Use one of the following percent ranges in the table.
0-19%, 20-39%, 40-59%, 60-79%, 80-100%

Areas where O_3 RFP should be tracked. See question a.	Stationary Sources						Mobile Sources	
	Major		Minor					
			Regulated		Unregulated			
	%	RO*	%	RO*	%	RO*	%	RO*
1.								
2.								
3.								
4.								
5.								

*The Regional Office auditor should ask the agency for documentation on the extent of updating the RFP inventory and initial in this column if documentation appears adequate.

d. New RFP tracking guidance entitled Revised Guidance For Tracking Reasonable Further Progress (RFP) In Ozone Control Programs, September 1986, was published by EPA to apply to post-1987 O_3 SIPs.

Is your agency aware of this guidance?

Yes_____ No_____

(If no, contact the Regional Office for more information.)

If yes, is your agency aware of its requirements?

Yes_____ No_____

Does your agency plan to implement these requirements?

Yes_____ No_____

If no, why? ____

____

____

____

____

B.4. CO Emission Inventories in CO Nonattainment Areas

If your State contains no CO nonattainment areas, check here [___] and go to B.5.

State/Local Agency Response

a. Indicate which response(s) below describe the geographic coverage and focus of your agency's CO inventory. (Check "x" where appropriate.)

1. ___ Major emphasis is on maintaining a CO inventory for highway vehicle sources for certain traffic areas such as Central Business Districts, intersections, or specific nonattainment areas
2. ___ Areawide or countywide CO inventory is maintained, covering major CO point sources, area sources and highway vehicles
3. ___ CO inventory is not currently maintained

b. Are woodstoves included in your CO emission inventory? ___ Yes ___ No

c. Is the highway vehicle inventory or transportation/traffic data used to locate potential CO hot spots?
___ Yes ___ No

EPA Regional Office Response (Confirmation or Comment) ______________________

____

____

____

____

____

B.5. Mobile Source Inventories in O_3 and CO Nonattainment Areas

Mobile source emissions inventories for highway vehicles are often compiled by the air pollution control agency acting in concert with the local planning agency or transportation department. In some instances, the local MPO or DOT will compile the inventory independently as the lead responsible agency. In general, mobile source emissions are calculated by applying mobile source emission factors to transportation data such as vehicle miles traveled (VMT), trip ends, etc. Mobile source emission factors are available for various vehicle types and conditions from an EPA emission factor model entitled MOBILE4 (or from earlier versions). Important conditions affecting emissions are vehicle age and mix, speed, temperature, and cold start operation.

If your State contains no O_3 or CO nonattainment areas, check here [___] and go to B.6.

State/local agency response

The State or local agency should answer the following questions even if a transportation or planning agency is responsible for the mobile source inventory.

a. Which agency maintains the highway vehicle emission inventory for the O_3 and/or CO nonattainment areas? (Check "x" where appropriate.)

1. ____ Air pollution agency (State or local)
2. ____ Local planning organization (MPO, COG, RPC, etc.)
3. ____ State or local transportation department (DOT)
4. ____ Other (specify ____)
5. ____ None is maintained
6. ____ Unsure

b. If an agency other than the air agency maintains the mobile source inventory, indicate what difficulties (if any) result. (Check "x" where appropriate.)

1. ___ No significant difficulties are evident
2. ___ Scheduling and coordination of activities are negatively affected
3. ___ The air agency loses control of the design and format of the inventory
4. ___ The responsible agency has not been adequately funded to be responsive
5. ___ Additional technical guidance is needed for effective communication of program needs to another agency
6. ___ Other (specify) ____

____

c. Conversely, indicate what benefits (if any) accrue from having another agency responsible for the mobile source inventory. (Check "x" where appropriate.)

1. ___ No significant benefits result

2. ___ Less resource drain on the air agency

3. ___ The air agency doesn't have to develop transportation planning expertise

4. ___ A better product results

5. ___ Other (specify) ____

____

d. Which emission factor model (MOBILE 2, 2.5, 3, or 4) was used to generate the mobile source emission factors for the most recently developed or maintained inventory? ____________ (Indicate number or "U" if unsure.)

e. Were the mobile source emission factors in the model tailored to your area to account for the following parameters? (Indicate "Yes," "No" or if unsure, specify "U.")

1. ____ Vehicle mix
2. ____ Vehicle age
3. ____ Speed
4. ____ Ozone season temperature
5. ____ Cold/hot start operating modes

f. Were data from the local transportation planning process used to compile the most recently-developed or maintained mobile source inventory? (e.g., VMT, street locations, traffic volumes, growth patterns, etc.)
Yes ____ No ____ Unsure ____

g. If not, were gross areawide estimates of VMT or gasoline sales used to compute emissions? Yes ____ No ____ Unsure ____

h. An important component of travel sometimes overlooked in mobile source inventories is VMT associated with minor roads and connnectors, often called "local" or "off network" travel. Was local travel included in your most recently-developed or maintained mobile source inventory?
Yes ____ No ____ Unsure ____

i. The results of an earlier audit indicated that significantly fewer mobile source inventories contained NO_x emissions than VOC emissions. Indicate if this is still so and why it is so for your agency. (Check "x" where appropriate.)

1. ___ Not so. Our mobile source inventory contains both NOx and VOC.

2. ___ NOx inventory not perceived as needed because NOx reductions are not required for O3 control

3. ___ NOx inventory perceived as needed for O3 but it was not included because of resource limitations

4. ___ Other (specify) ____

____

j. An earlier year's audit asked each agency to specify the base year of the mobile source inventory in the SIP, which gave a limited idea of how well these inventories have been maintained to the present. What is the latest year of record for which your agency's highway vehicle inventory has been updated? When was this done?

1. 19____ (latest year of record)

2. 19____ (year when latest update was performed)

EPA Regional Office Response (Should confirm the answers in B.4)____________

____

____

____

____

B.6. PM_{10} Inventories in Group I and II Areas

Current guidance requires that PM_{10} emission inventories be developed for Group I and Group II areas, which have moderate to high probabilities for nonattainment of the PM_{10} ambient standard levels. The following questions address the availability of information/guidance needed to compile the PM_{10} inventories and areas of difficulty encountered by State/local agencies in compiling these inventories. (NOTE: If your State contains no Group I or II areas or if your local agency responding to this audit survey is not in a Group I or II area, check here [_____] and do not complete this section.)

State/local_agency_response

a. EPA has issued guidance and requirements for compiling PM_{10} emission inventories. This information was presented at PM_{10} Workshops held in August 1987 at four U.S. locations and published in PM_{10} SIP Development Guidance, supplemented. To what extent has your agency understood this guidance and requirements in initiating your PM_{10} inventory efforts? (Check "x" where appropriate.)

1. _____ The guidance and requirements were readily understood. Inventory efforts are proceeding.

2. _____ The guidance and requirements were moderately difficult to interpret and further guidance was/is/will be sought from EPA. Inventory efforts are proceeding even while awaiting some clarification.

3. _____ The guidance was very difficult to understand. Clearer guidance and requirements are needed before proceeding with PM_{10} inventory efforts.

4. List all problem areas:

____
____
____
____
____

b. EPA has published PM_{10} emission factors in Compilation of Air Pollutant Emission Factors, AP-42 (as supplemented). Have these been adequate to develop the PM_{10} inventory? If gaps in your inventory have been encountered or are anticipated, due to lack of PM_{10} emission factors in particular source categories, what percent of your inventory does (would be) affected by such gaps (check "x" where appropriate)?

0-10% __________

11-20% __________

21-40% __________

over 40% ________

c. List specific areas in your PM_{10} inventory where gaps exist:

____________________ ____________________
____________________ ____________________
____________________ ____________________
____________________ ____________________
____________________ ____________________

d. EPA recently established an Emission Factor Clearinghouse focusing on PM_{10}. A Clearinghouse Contact has been designated in each EPA Regional Office. The purpose of the Clearinghouse is to facilitate filling of PM_{10} emission factor gaps. The Clearinghouse responds to State/local requests and tries to fill gaps by technology transfer and other quick techniques, where emission factors are needed for particulate source categories and also evaluates agencies' own proposals for filling these gaps. Where possible, data used to develop new emission factors will be made available. To what extent will your agency use the Clearinghouse? (Check "x" where appropriate.)

_____ little or not at all (have nearly all the PM_{10} emission factors that are needed)

_____ to a moderate extent (will be helpful in completing the inventory)

_____ extensively (will rely on it heavily since many gaps exist or are anticipated)

4. PM_{10} inventories cover point, area and mobile sources. Does your agency have sufficient guidance for all three types of sources to complete the inventory? (Mark "x" where appropriate.)

Yes _____

No _____

If no, for which type(s) of sources do you lack sufficient guidance?

Point ____

Area ____

Mobile____

C. Modeling

C.1. Experience and Training

The ability of an agency to effectively deal with modeling problems depends upon the personnel resources available to the agency. Competent and experienced personnel are essential to the successful application of dispersion models. The need for specialists is critical when more sophisticated models are used or the area being studied has complicated meteorological or topographic features. Please summarize your agency's staff levels and modeling experience.

State/Local Agency Response:

a. Please complete the following table indicating the number of persons in each of the training and experience categories:

	Experience			
Training	0-2 yrs	2-5 yrs	5-10 yrs	>10 yrs
1. Meteorologist				
2. Engineer/Scientist with modeling training				
3. Engineer/Scientist without modeling training				
4. Other educational background with modeling training				
5. Other educational background without modeling training				

EPA/Regional Office Response (confirmation or comment):

C.2. Model Availability

The ability of an agency to effectively deal with modeling problems that may arise also depends on the facilities (hardware and software) available to the staff to perform or confirm modeling analyses. Please summarize below your agency's accessibility, expertise and usage of computer-based air quality models.

State/Local Agency Response:

a. To which air quality models does your staff have access? Also indicate whether your staff is capable of running the model and the approximate number of applications during the last fiscal year.

1. Circle UNAMAP version number 6 5 Other Don't know

2. Specific Models

		Access (yes or no)	In-house Expertise to Use (yes or no)	Yearly Usage (Estimated Number of Applications)
EPA Guideline Models(1)	BLP			
	CALINE3			
	CDM 2.0			
	CRSTER			
	ISCLT			
	ISCST			
	MPTER			
	RAM			
	UAM			
	OCD			
Other Models(2)	APRAC-3			
	AQMD			
	PAL-2			
	PLUVUE II			
Screening Techniques(3)	PT MAX			
	PT DIS			
	PTMTP			
	PTPLU-2			
	VALLEY			
	COMPLEX I			
	LONG Z/SHORT Z			
	EKMA			

b. Is access generally by:

1. ____ Telephone line to State/local agency mainframe computer?
2. ____ Telephone line to private or subscription computer?
3. ____ In-house dedicated computer?
4. ____ Telephone line to EPA computer?
5. ____ Personal Computer?

c. Does your staff have the capability to modify software for the above models? ______ Yes ______ No
If yes, which models have been modified? ________________________
____

Where modified guideline models have been used, State/local agency should answer appropriate part of question C.3.

Footnotes:

(1) Models recommended in the "Guideline on Air Quality Models (Revised)" (1986) and Supplement A (1987).

(2) In addition to the examples given, list the nonguideline models available to you and indicate whether any have been used on a case-by-case basis. Include long range transport models, photochemical models, complex terrain models and any other models for situations for where EPA has not provided guidance.

(3) In addition to the EPA screening techniques listed, indicate the accessibility and usage of any other screening techniques available to you.

EPA/Regional Office Response (confirmation or comment):

C.3. Alternative Modeling Techniques

EPA modeling guidance recommends specific models and data bases to be used in regulatory modeling. However, the guidance also indicates that an alternative model or data base may be used in an individual case if it can be demonstrated that the alternative technique is more appropriate than the recommended technique. Describe the number of, and circumstances related to, modeling analyses where it was necessary to use alternative techniques from those specifically recommended in EPA guidance.

State/Local Agency Response:

a. In approximately what number of the modeling analyses performed by your agency in the last fiscal year was it necessary to use techniques not specifically recommended in EPA guidance?

1. _______ times out of ______ modeling analyses performed.

b. If an alternative model was used, indicate the reason(s) for its usage, using the list below: (alternative data bases are covered in part C of this question)

	Number of Cases	Reason(s) for Use*
1. Use of nonguideline model	__________	_________
2. Modification of guideline model	__________	_________
3. Use of nonrecommended option in a guideline model	__________	_________
4. Use of guideline model outside its stated limitation	__________	_________
5. Other (describe ______________)	__________	_________

*Reasons for use: (List one or more of the following codes as applicable in the space above)

CODES
A. The alternative technique was judged, for technical reasons, to be more appropriate for the situation.
B. Lack of access to the guideline model recommended for the situation.
C. The alternative model was judged, through a performance evaluation, to be more appropriate for the situation.
D. No EPA guidance applies to the situation.
E. Other (specify below).

c. If there are cases where the selection/usage of data bases for models are different from those recommended in EPA guidance, please indicate the number and circumstances surrounding each case.

	Number of Cases	Reason (brief Statement)
1. Use of less than 5 years of off-site or less than 1 year of on-site meteorological data.	________	________________ ________________
2. Use of techniques other than those contained in the "Guideline on Air Quality Models" for determining background	________	________________ ________________
3. Use of techniques other than those contained in EPA policy on treatment of calms	________	________________ ________________
4. Use of techniques other than those contained in the EPA policy on design of receptor network	________	________________ ________________

EPA Regional Office Response (confirmation or comment):

C.4. Modeling Analyses

a. State and local agencies will normally conduct/review and submit to EPA modeling analyses to support certain actions. EPA will review these analyses case-by-case and approve or disapprove them in the Federal Register.

TO BE COMPLETED BY THE EPA REGIONAL OFFICE:

Please indicate in column A approximately how many modeling analyses described above were submitted to EPA during the last fiscal year in each of the program areas listed below. In column B, indicate the number of analyses where EPA has required the State/local agency to revise the analysis. In column C, use the code letters provided below to indicate the technical areas contributing to the answer given in column B.

	A # of analysis reviewed	B # of analysis requiring revision	C Contributing factors*
1. Bubble (emission trades)			
2. Section 107 redesignations			
3. New source review (including PSD)			
4. Nonattainment area SIP analyses			
5. Lead SIP's			
6. Other SIP modeling			

*Indicate by code(s) which of the following technical areas were either inadequate or deviated from EPA Guidance.

CODES

A.	Use of inappropriate guideline model
B.	Use of nonguideline model without a performance evaluation to demonstrate acceptability of the model
C.	Urban/rural dispersion coefficients
D.	Emission inventory and operating design parameters
E.	Meteorological data base
F.	Receptor network design
G.	Complex terrain considerations
H.	Downwash consideration
I.	Comparison with acceptable air quality levels
J.	Technical documentation of modeling analysis
K.	Other ________________

State/Local Agency Response (confirmation or comment)

b. In those instances where the modeling analysis supporting a particular action is performed by industry and/or other governmental entity, the agency will review and approve or disapprove the modeling analyses.

TO BE COMPLETED BY THE STATE/LOCAL AGENCY:

Indicate in column A approximately how many modeling analyses described above were reviewed during the last fiscal year in each of the indicated program areas. In column B, indicate the number of analyses where the agency required the responsible party to revise the analysis. In column C, use the code letters provided below to describe the technical area contributing to the answer given in column B.

	A # of analysis reviewed	B # of analysis requiring revision	C Contributing factors*
1. Bubble (emission trades)			
2. Section 107 redesignations			
3. New source review (including PSD)			
4. Nonattainment area SIP analyses			
5. Lead SIP's			
6. Other SIP modeling			

*Indicate by code(s) which of the following technical areas were either inadequate or deviated from EPA Guidance.

CODES
A. Use of inappropriate guideline model
B. Use of nonguideline model without a performance evaluation to demonstrate acceptability of the model
C. Urban/rural dispersion coefficients
D. Emission inventory and operating design parameters
E. Meteorological data base
F. Receptor network design
G. Complex terrain considerations
H. Downwash consideration
I. Comparison with acceptable air quality levels
J. Technical documentation of modeling analysis
K. Other ______________________________

EPA Regional Office Response (confirmation or comment):

Chapter 3

New Source Review Audit Guidelines

FY 1988-1989

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3. NEW SOURCE REVIEW

1.0 INTRODUCTION

The procedures for carrying out the FY 1988-1989 NSR audit will remain largely the same as they were for FY 1985-1987. That is, the same four questionnaires will be used, and the onsite audit will continue to focus on the examination of current permit files. Perhaps the most significant change is the overall switch to a two-year audit cycle. As a result, individual NSR programs will be audited every two years. Some changes have been made with respect to the audit forms, primarily for the purpose of clarification, but also in some cases to modify or expand the type of information that will need to be collected. Specific changes are included in a later section which describes each of the questionnaires. The four questionnaires are:

1. NSR Permit Summary Questionnaire (Form 1)

2. NSR Audit Summary Questionnaire (Form 2)

3. Permit File Questionnaire for Major Sources Subject to PSD or Part D (Offsets) (Form 3)

4. Permit File Questionnaire for Sources not Subject to PSD or Part D (Offsets) (Form 4)

Some of the audit subjects covered in this section continue to involve, in whole or in part, issues that could be affected by proposed EPA rulemaking or ongoing litigation [e.g., CMA agreement rulemaking proposed on August 25, 1983 (48 FR 38742)]. These particular items are potentially impacted by regulatory amendment. Should changes to the affected requirements be promulgated, EPA will issue revised guidance as to how the audit should handle them. Until such time that the existing Federal requirements and the State rules developed pursuant to these 40 CFR Part 51 provisions can be changed, this guideline will assume that all rules will continue to be implemented under the EPA requirements presently in effect.

2.0 FY 1988-1989 NSR AUDIT PROCEDURES

At least 30 days before the scheduled onsite audit, the Regional Office should send a copy of Form 1 to the appropriate agency. Audited agencies should be asked to complete the questionnaire before the onsite audit so that it can be returned to the audit team before or during their visit. A set of instructions for completing Form 1 should accompany the questionnaire when it is sent to an agency. The instructions provide important information which will help to ensure that the agency responses will be made in a reasonably consistent format.

The file review is a very important aspect of the NSR audit process. For the new source review audit, permit files should be selected on the basis of permit action type, source type and size, source location, public concern, and other factors geared to ensuring review of a variety of permitting actions and decisions by the agency. Criteria to consider include:

- Review both large (major) and small (minor) sources;
- Review both new plants and plant modifications;
- Review a PSD source for which preconstruction monitoring data requirements apply;
- Review a PSD source near a Class I area;
- Review sources that avoided PSD or Part D review because of restrictions on their operation or capacity;
- Review some sources in nonattainment and sanctioned areas, if applicable;
- Review some of the most common source types in that State (for example, boilers and asphalt plants), but also review a variety of other source types; and
- Review a PSD source with toxic "unregulated" pollutants, to ascertain whether the BACT determination appropriately addresses them.
- Review a controversial permit, a permit of high public interest, or one that would be of particular interest for reasons other than those described above.
- Tabulate total number of permits and categories of these permits;

By combining several of these factors in one permitting action, it may be possible to satisfy the criteria above with only a relatively few permits. Generally, however, in order to obtain a reasonable sampling of permits, the auditor should randomly select at least five PSD/Part D and ten other permits issued since the last audit. If this random selection does not seem to represent the variety of criteria indicated above, the auditor should note this and specifically select additional permits for review which do reflect the missing criteria.

For the 1988-89 NSR audit, the auditor is NOT required to fill out the file audit questionnaires for every permit file selected and examined. Instead, after selecting the permit files that will be examined, in accordance with the criteria described above, audit questionnaires should be filled out for a minimum of ONE PSD, ONE Part D (offsets) and THREE other (non-PSD/Part D) permits. The following procedures should be used:

1. For completion of the PSD/Part D permit questionnaire (Form 3)--

Select the most recent PSD permit and the most recent Part D (offset) permit and fill out the major source questionnaire, to the extent applicable, for each one. In case the agency did not issue at least one of each of these types of permits, select and review at least two of the other type, preferably the most recent new plant and the most recent modified plant.

2. For completion of the non-PSD/Part D questionnaire (Form 4)--

Beginning with the most recently issued permits, select at least three permit files that represent a variety of permit review situations as described in the criteria above. A file should be rejected only if it too closely resembles a file already selected for evaluation using the questionnaire, except that the auditor should try to include at least one permit where major review was avoided through restrictions to the source's operation or capacity.

3. All remaining major and minor source permits should be examined as time allows using the appropriate questionnaire as a guide to ensure that the applicable audit topics are adequately addressed. The auditor may complete the questionnaire for any or all of the remaining permit files, but he or she is not required to do so. It is understood that permit file review time may vary greatly. Auditors are encouraged to review as many of the selected files as possible, but, should time run short, they are advised to conduct only a limited review of these remaining files, concentrating on problems identified by the completed questionnaires to determine whether the problem is common to several permits or only to an isolated case. Of course, if time is available, auditors should conduct a more detailed review of the remaining permits (as well as others not originally selected) to see if any additional observations can be made.

It cannot be over overemphasized--auditors must not use all the time examining permit files at the cost of meaningful communications with audited agencies. In conducting the onsite audit, auditors are advised to strike a reasonable balance between examining the selected permit files and maintaining meaningful dialogue with the appropriate agency personnel. Feedback from the FY 1986-87 audit indicated that, although auditors have increased their dialogue from FY 1985, more emphasis is still needed. The lack of dialogue was generally cited as a problem by the auditors and the audited agencies alike. An example of how such dialogue could be achieved is to have an agency representative--preferably the permitting engineer most familiar with the selected permit file--present during the examination of one or more permit files.*

The presence of the agency representative would enable him or her to observe how the file audit is actually conducted. More importantly, such individual would be able to help expedite the file search by indicating at the appropriate times during the file audit where (and whether) specific information is to be found. At the same time, he or she is likely to become more appreciative of the need for carefully organized and well documented files as specific information is being sought from the file to complete the appropriate questionnaire. It is also important that an opportunity be afforded for the auditor to explain applicable new source review requirements and procedures where a lack of understanding may be apparent. In all, both the auditor(s) and the agency representative(s) stand to benefit from dialogue occurring in conjunction with the file audit.

---

*An alternative approach might be to meet with some of the permitting engineers after having completed several file audits to explain how the file audit was conducted and to explain how certain conclusions were reached in responding to the file audit questionnaires. During this time, the auditor may also want to ask certain questions of the engineers with regard to any unanswered or unclear issues.

Auditors will find it useful to take with them a calculator and a few basic documents:

(1) Copies of 40 CFR 51.18 and 51.24 [now recodified under 40 CFR 51, Subpart I]

(2) AP-42, for checking whether all emission units were included, and

(3) A copy of the reference sheet included in this guidance. (Table 1.)

3.0 COMPLETING THE AUDIT REPORT

At the close of each audit, the auditor(s) should have (a) approximately 5 completed NSR questionnaires--2 for major sources and 3 for minor (or not subject to PSD or offsets) sources; (b) notes (or additional questionnaires) on approximately 10 additional permit files; and (c) a subjective impression of the audited agency. This information must now be organized and reported so that it can be incorporated into the State or local agency audit report.

The NSR audit report should be written in a narrative form, organized as closely as possible according to the NSR audit topics and specific areas of concern (questions) under each topic. Figure 1 identifies the seven NSR audit topics and associated audit questions. These topics and questions were selected for auditing by the new source review audit committee comprised of State, local, and EPA representatives. The audit topics and questions, originally defined for the FY 1984 audit, serve as the basis for development of the permit file questionnaires. For FY 1988-89, the questions are to be answered primarily on the basis of information found in the audited files, but discussions with agency personnel will also be useful.

The information that will be available to each auditor consists of both background information (such as the number of sources proposing to locate within 100 km of a Class I area) and evaluative information (such as whether an agency is incorrectly using actual emissions, rather than potential to emit, to determine applicability to PSD or offsets). In preparing the NSR audit narrative, the auditor should try to use both types of information to formulate the findings and recommendations.

For each problem identified from the permit files, the following considerations should be taken into account and discussed in the narrative where possible:

a. The number of cases where the problem was identified versus the total number of permit files examined for that particular problem.

b. Whether the problem is a new one or is a carryover of a situation that had been identified by previous audits.

c. The likely reasons for the occurrence of the problem, e.g., inadequate procedures, failure to adhere to existing procedures, insufficient training or resources, lack of EPA guidance, etc.

The auditor's subjective judgment can affect conclusions in two ways: by deciding how serious the problem itself is, and by deciding whether there are special circumstances which affect the seriousness of the problem. It is important to make certain that perceived problems are discussed with the audited agency in order to more clearly understand the true nature of the problem or to determine whether a problem actually exists. Before a problem is actually listed in an audit report, the auditor should discuss the issue with the appropriate personnel in the affected agency. Often, a lack of information is just a difference in filing systems. Give the auditing agency an opportunity to provide solutions before writing up an issue as a problem. Where a problem is suspected, the auditor's assessment and the basis for that assessment should be clearly documented in the narrative report. When problems are identified to agencies, the reviewer should distinguish between very serious problems and problems that would just be "nice" to resolve.

If there are fewer than five permits in a data base, it may be difficult to draw conclusions on how widespread a problem is. However, subjective impressions often offer valuable insight and are encouraged in these situations.

Recommendations should reflect the potential seriousness of the problem. The factors outlined above should also be considered in developing recommendations for resolving each identified problem. Potential solutions to problems found during the audit should be discussed with the audited agency during the exit interview. Tentative solutions to some problems may be negotiated at the time and described in the audit report.

The NSR audit reports (narrative plus appropriate number of copies of Forms 1 through 4) should be incorporated into the State or local agency audit report and forwarded to EPA (CPDD) in accordance with existing guidance. It is important that all of the completed forms that are submitted as part of the audit report be neat and legible. If originals are not sent to Headquarters, then the proper care should be taken to ensure that all copied material can be easily read.

Auditors should take special note and report on any innovative or alternative permit conditions that agencies have used that meet Federal requirements but which lead to more effective compliance determinations or may ensure better operation and fewer violations. The EPA will describe such permit conditions in its national report, allowing other agencies to learn better methods of writing NSR permits.

4.0 SUGGESTED WORKSHEETS

Feedback from the 1986/87 audits indicates that the information requested on Forms 3 and 4 is not always presented in the same order in a permit as in the form. Therefore, a new worksheet has been developed (see Form 5 on page 3-57), and may be used when reviewing selected permit files. Use of the worksheet may make it easier to find the information requested on the audit form.

5.0 NEW DEVELOPMENTS IN NEW SOURCE REVIEW

As with all other things, new source review changes over the years. There have been several modifications in the NSR policy that affect permitting as well as potential and actual changes in regulations. The auditors should probably discuss these with the agency being reviewed. These include:

1. There is renewed emphasis on good quality BACT determinations. The EPA expects agencies to do a top-down analysis for BACT determinations; this means that the presumptive BACT is LAER. The EPA also wants agencies to consider toxic implications while doing BACT determinations.

2. An important aspect of BACT, brought out by the Administrator's North County Remand (PSD Appeal No. 85-2), is that all pollutants, including those not directly regulated by the Act, are to be considered in making the BACT determination. The BACT review should reflect this consideration of "unregulated" toxic emissions and the BACT limit tightened if appropriate. (For the purposes of the audit, this class of pollutants is referred to as "air toxics" or "toxic air pollutants.")

3. The PM_{10} NAAQS has been promulgated; this means that PSD SIP's must eventually do analyses for PM_{10} as well as TSP. The audit forms have been modified to include PM_{10}. The EPA Regional Offices should be aware of each State's SIP with regard to PM_{10} and make sure that PM_{10} is reviewed where applicable.

4. Rulemaking pursuant to CMA may be promulgated this year, but no one may use regulations revised pursuant to CMA until the regulations are incorporated in their SIP. This will probably not occur during the FY 1988-89 audit timeframe.

5. Rulemaking pursuant to a suit from the Sierra Club is being conducted by EPA. This rulemaking may require an increment analysis for NO_x emissions. This rulemaking will not become effective until October 1989, which is after the FY 1988-89 audit timeframe.

Finally, this audit cycle may be the last audit analysis NSR permits after they have been issued. It is obvious that catching mistakes after the permit has been issued is not extremely useful in improving that quality of audited permits. Although it is true that when agencies are notified of errors in their permits they do attempt to avoid making the same errors again, it is also better to avoid ever making the errors. To this end, EPA is developing a program to ensure that EPA will review most significant NSR/PSD permits before they are issued. This will allow EPA to comment on permits early enough in the permit process to allow full incorporation in the resulting SIP. All members of the NSR community will be kept informed as this policy is developed.

Figure 1. MAJOR NSR AUDIT TOPICS AND ASSOCIATED AUDIT QUESTIONS

I. PUBLIC PARTICIPATION REQUIREMENTS

1. For which new or modified sources was the public afforded an opportunity to comment on proposed permits? Is the State meeting their SIP requirements for public comment?

2. Do the public notices routinely provide adequate information?

3. Were other State and local air pollution control agencies and other officials whose jurisdictions might be affected by the proposed new or modified source notified of the proposed action?

II. APPLICABILITY DETERMINATIONS

1. Does the agency apply the proper source definition(s) and exemption provisions? What definition of "source" is the agency using (plantwide, dual source, or something else)?

2. Does the agency typically use the best available emission projections and federally enforceable restrictions[*] in defining a new source's (or unit's) "potential to emit"?

3. Does the agency routinely use an existing source's "potential to emit" to determine major source status for proposed modifications?

4. Does the agency use as its netting baseline actual emissions expressed in TPY?[*]

5. Verify that the agency does not allow for "double counting" of emission decreases used for netting purposes.

6. Does the agency adequately address fugitive emissions[*] in calculating the "potential to emit" and the "net emission increase"?

7. Does the agency properly apply the §107 area designations when determining what type of preconstruction review will be required of major construction?

8. Verify that the agency does not approve major construction projects in designated nonattainment areas under an EPA-imposed construction moratorium.

III. CONTROL TECHNOLOGY

1. Does the review agency check the applicants' selection of the appropriate control technology? Does the review agency do a thorough, substantive review of these determinations?

2. Does the BACT analysis consider each regulated pollutant emitted in significant amounts?

3. Does the BACT review reflect consideration of toxic air pollutants in choosing the level/type of controls for the regulated pollutants?

4. Does the review agency require the consideration of more than one control alternative? To what extent are economic, energy, and non-air environmental impacts considered in the BACT analysis?

5. What tendency is there for the agency's BACT/LAER determinations to conform exactly to minimum EPA requirements?

6. Does the agency adequately review non-NSR/PSD sources for applicability to the NSPS and NESHAP requirements?

7. Does the agency do a top-down BACT analysis? When using top-down anlaysis, what is the basis for selecting the most stringent (top) control alternative (i.e., LAER, BACT/LAER clearinghouse, or EPA BACT/LAER policy determination)?

8. Will the final selected control technology result in emissions less than BACT? Why was the stricter technology chosen? Were the NAAQS or air quality increments in jeopardy?

IV. AIR QUALITY MONITORING DATA--PSD

1. Does the agency follow the correct procedures to exempt applicants from the preconstruction monitoring requirements?

2. Does the agency adequately ensure that existing data meets Federal criteria for representative air quality data when applicants are not required to conduct new monitoring? What is the RPA Regional Office interpretation of the monitoring requirements for each source?

3. Do the source monitoring data adhere to PSD quality assurance requirements?

V. AMBIENT AIR QUALITY IMPACT

a. PSD Increment Consumption

1. Does the agency adequately consider the baseline concentration and emission changes which affect increment consumption? Does the agency have a system to track increment consumption? Was this system used?

2. Are long- and short-term PSD increments being given adequate consideration as part of the ambient impact analysis?

3. Does the agency make an adequate assessment of new sources and modifications on the Class I area increments?

b. NAAQS Protection

1. What emission baseline does the agency require to be used to evaluate the impact on the NAAQS of new and modified sources?

2. Does the agency routinely evaluate the ambient impact of minor source construction?

3. Does the agency's ambient impact analysis provide adequate protection against the development of "hot spots"?

c. Dispersion Models

1. Does the agency use adequate models and model options to carry out the ambient impact analyses for screening analyses? for more refined analyses?

2. Does the agency perform an independent, internal review of the modeling analyses contained in the permit application?

VI. EMISSION OFFSET REQUIREMENTS

1. Does the agency require that all offsets be Federally enforceable?

2. Does the agency routinely ensure that the emission offsets are not otherwise needed to show RFP or attainment?

3. Does the agency require that the emission baseline for offsets be expressed in the same manner as for RFP?

4. Does the agency's offset requirement cover other emission increases since the last offset review? If not, does the agency track minor source growth and account for minor source emissions increases in the attainment strategy?

5. Does the agency require that offsets occur on or before the time of new source operation?

6. Does the agency allow offsets resulting form early source shutdowns or production curtailments?*

VII. PERMIT SPECIFICITY AND CLARITY

1. Does the agency identify all emission units and their allowable emissions in the final permit(s)?

2. Are the allowable emission rates stated or referenced in the permit conditions?

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*This audit question could be affected by proposed EPA rulemaking or by ongoing litigation [e.g., CMA agreement rulemaking proposed on August 25, 1983 (48 FR 38742)]. Should changes to the affected requirements be promulgated, EPA will issue revised guidance as to how the audit should handle them. Until such time that the existing Federal requirements and the State rules developed pursuant to these 40 CFR Part 51 provisions can be changed, this guideline will assume that all rules will continue to be impemented under the requirements presently in effect.

3. Are the compliance test methods stated or referenced in the permit terms and conditions? Does the permit specify when initial compliance is to be demonstrated?

4. If a source's calculated potential to emit is based on less than full design capacity and continuous, year-round operation, are all limiting restrictions clearly identified in the permit?

5. Does the permit specify the averaging time of each emission limitation? Is the averaging time consistent with the averaging time of the applicable NAAQS and PSD increments?

6. Does the permit specify the method and frequency of reporting continuous compliance? Are the methods consistent with the averaging time of the standard?

7. Are excess emissions defined in terms consistent with the applicable emission standards and averaging times?

8. If these above things are not found in a permit, has the State been having problems enforcing permits?

6.0 DESCRIPTION OF THE PERMIT FILE QUESTIONNAIRES

The auditor will gather data primarily from selected permit files. Depending on the permit file selected, the auditor will use either Form 3 or Form 4 in accordance with the procedures described in the previous section. The choice of questionnaires should be based on the type of preconstruction review that the reviewing agency actually carried out in each case. Form 3 is designed to be used to evaluate permit files for which the reviewing agency considered the proposed source subject to PSD or Part D (nonattainment area/offset) requirements.

Form 4 was designed to evaluate permit files where the reviewing agency determined that the proposed source was not subject to PSD or Part D (offset) requirements. This would include cases where a major source underwent a modification involving insignificant emission increases, as well as sources that were allowed to avoid PSD or Part D review by restricting their potential to emit. This questionnaire includes questions that will help to determine whether the agency followed the correct procedures in subjecting a source to a non-PSD/Part D source review rather than a PSD/Part D source review.

6.1 Source Information--(Section I)

The basic data needed to identify the permit file reviewed are requested in Section I of both questionnaires (Forms 3 and 4). The questions pertain to the overall source--not the particular configuration of emission units which may be the subject of the current permit review. Thus, "Source Category" refers to one of the 28 listed PSD sources or any other category which best describes the overall source.

"Location" refers to a geographical identifier that will help the auditor to identify the specific source under review. The identifier is primarily for the auditor's benefit and may be expressed as a complete address, or simply in terms of the city or county of location.

"Region" refers to the two-digit Arabic number, such as 01 or 10; and "State" is the appropriate two-letter code, such as AL or AZ.

"Type of Review" refers to the status of the proposed source action relative to the overall source. Thus, the addition of a new boiler to an existing source would be a modification rather than a new source. (Note that the status of individual emission units should be designated in Section III.)

6.2 Public Participation and Notification--(Section II)

Public participation requirements for review of new and modified sources are set forth under 40 CFR 51.161 and 51.166(q) [formerly numbered 5.18(h) and 51.24(q)]. These requirements call for the issuance of a public notice which informs the public of a pending permit action and of the opportunity for public comment or hearing prior to final agency action on a source application.

Previous audit results indicate that some agencies require public notification for all permits issued, but many agencies do not. This year's audit seeks further information as to what specific sources the public was notified of, and how adequate the notification was.

Both questionnaires ask for the same information that was requested last year. Because of concerns pertaining to the usefulness of public notices versus the costs of providing such notices, the FY 1988-1989 audit continues to ask what it costs to issue a public notice. The answer should indicate the amount charged by the newspaper or other media to publish the notice. If this information is not available in the file (e.g., a copy of the receipt), the auditor may wish to determine an approximate cost from the audited agency, but it is not recommended that too much time be spent trying to obtain this cost.

The public notice should inform the public of the availability for their inspection of the application submitted by the source, the estimated impact of the source on ambient air quality, and the agency's proposed action to approve or disapprove the permit. The notice should also indicate the nature of the analysis of air toxics, consistent with EPA guidance. Instructions for submitting comments, as well as the opportunity for a public hearing, should also be addressed. The auditor should verify that notices issued by the agency adequately inform the public of the permit being considered and of their opportunities to provide input to the final determination.

In addition to providing adequate notice to the public in general, certain parties are to receive specific notification of proposed permit actions where those parties would be directly affected by the proposed source. The auditor should verify that the agency has, and uses, a mechanism for notifying the appropriate government officials when the proposed source may affect their jurisdiction. The auditor should particularly note, in the case of PSD sources, whether and at what point in the process the Federal Land Manager (FLM) is notified of any pending agency action on a source locating within 100 km of a Federal Class I area. In addition, the auditor should identify, for information gathering purposes, any other criteria used to trigger notification of the FLM.

6.3 Applicability Determinations--(Section III)

State and local governments are expected to regulate not only PSD and Part D sources but also construction of other air pollution sources. The agencies are, however, particularly expected to strive for the level of consistency needed to satisfy the minimum Federal requirements for subjecting new and modified PSD and Part D sources to preconstruction review.

6.3.1 Definition of Source

The auditor should verify, through the review of selected permit files, that the appropriate levels and detail of review are being made. The listing of emission units provides a basis for determining the answers to several questions, so it should be as complete as possible.

Agencies must use, as a minimum, the appropriate Federal definitions of "source" to make applicability determinations. The number of definitions used by any particular agency will depend upon the specific Federal preconstruction review requirements being implemented by the audited agency under an approved SIP or delegated authority. The auditor should be familiar with the following situations:

For PSD, the agency should use a reasonable grouping of emission units as one stationary source, classified according to its primary activity, *i.e.*, same two-digit SIC code. The industrial grouping will determine the applicable emission threshold (100/250 TPY) governing major source status, and therefore whether PSD applies.

For nonattainment areas, including areas where the construction ban (40 CFR 52.24) is in effect, one of several definitions of source may apply. The possibilities include the plantwide definition, as described for PSD above, the dual definition which considers a "source" to be both the plant and each of its individual pieces of process equipment, or another definition based on previous EPA requirements preceding the Alabama Power court decision. The auditor must know which definition is actually being used by the agency in order to determine that it is being correctly applied.

For NSPS and NESHAPS, the applicable "source" is defined by various subparts of 40 CFR Parts 60 and 61, respectively. The auditor should verify that the NSPS/NESHAP applicability determinations are made independently of the PSD or Part D (offset) determinations. This is particularly important where the PSD or Part D requirements do not apply, e.g, "minor" sources, major sources which have *de minimis* net emission increases for the pollutant of concern, or sources where exemptions from the PSD or Part D requirements are otherwise granted by the agency.

6.3.2 Fugitive Emissions

Fugitive emissions, to the extent they are quantifiable and emitted by any of the listed source categories, should be included in the emission calculations for determining whether a source is major and subject to PSD or Part D review. For the auditors' convenience, the listed source categories have been included in the Reference Table (see Table 1) which is to be used with the FY 85 audit questionnaire. For other source categories, i.e., those not listed, the source must first be evaluated as to whether it is major without using fugitive emissions. However, fugitive emissions should be included in the ambient impact analysis and other review requirements whether the source is major or minor. The auditor should verify that the emission factors used to calculate fugitive emissions are documented and reviewed by the agency independently from any use of such factors by the applicant.

6.3.3 Potential to Emit

The status (PSD/Part D or non-PSD/Part D) of new or modified sources must be determined on the basis of the source's potential to emit. "Potential to emit" is a source's maximum capacity to emit a pollutant under its physical and operational design. In order for any physical or operational limitations to be considered as part of the source's design (to restrict the maximum capacity of the source), the limitations must be made an enforceable part of the permit. Moreover, the limitations must be Federally enforceable, which requires that the permit condition(s) be identified in the construction permit or an operating permit that has been specifically incorporated in the approved SIP.

The auditor must determine whether the audited agency correctly applies the concept of "potential to emit" when making applicability determinations. Both questionnaires ask questions concerning the use of acceptable, well-documented emission factors as well as the use of special limitations to define a new source's potential to emit. The auditor should determine whether restrictions to a source's potential to emit are properly applied, particularly when they are used to allow the source to avoid PSD or Part D review.

For modified sources, it is important to note that major source status in terms of potential emissions of the existing source must be taken into account. This involves the existing source's maximum capacity, which may take into account all control equipment and operating restrictions that are Federally enforceable. Previous audits have shown that there may be a tendency on the part of some air pollution control agencies to overlook the potential to emit of the existing source, particularly when actual emissions are significantly less than the applicable major source cutoff size. The auditor, by completing Form 4, should be able to determine whether any problems exist with this aspect of the audited agency's applicability procedures.

6.3.4 Emission Netting

For modifications to existing sources, once the major or minor status of the existing source has been affirmed, the applicability review of proposed modifications should be based on the net change in actual emissions on a tons-per-year basis. For example, emission changes occurring from retiring equipment or other methods of emission reduction generally will be credited on the basis of the difference in the emission unit's actual emissions before and after the reduction. Actual emission estimates generally should be based on either: (1) reasonable engineering assumptions regarding actual emission levels and representative facility operation over a two-year period, or (2) permitted allowable emissions determined on a site-specific, case-by-case basis so as to be representative of actual source emissions. Where an emission unit has not begun normal operations, the potential to emit of the unit should be used.

Any net change in actual emissions that would result in a significant emission increase at an existing major stationary source must generally be reviewed as a major modification. However, for this to be true in a nonattainment area, the existing source must also have the potential to emit in major amounts the nonattainment pollutant(s) for which a significant net increase would occur. For proposed new major sources subject to PSD, PSD review applies to all criteria and noncriteria pollutants that would be emitted in significant amounts.

For the auditors' convenience, the EPA-defined significant emission rates for criteria and noncriteria pollutants regulated under the Clean Air Act have been included in the Reference Table (Table 1) attached for use with the file audit questionnaires. The auditor should check all applicability determinations carefully with respect to significant emissions. Some agencies do not appear to use the EPA significance values to trigger review of major modifications. Instead, they may be using some uniform cutoff point that tends to be more restrictive than the required significance values for some pollutants but less restrictive for other pollutants.

The worksheet provided in Section III.D. of both questionnaires should be used to determine the net change in emissions. It should be noted that EPA policy requires the emission changes resulting from the proposed modification itself to be significant before considering other contemporaneous emission increases and decreases that may have occurred before the proposed modification. If the proposed modification does not result in a significant emission increase, then a major modification is said not to occur regardless of how previous contemporaneous emission changes would alter the net emission change. State and local agencies may implement a more stringent policy if they wish to do so. Where this is the case, the auditor should note such policy and evaluate the permit in accordance with the more stringent policy.

Adequate safeguards should be taken by the agency to prevent the use of contemporaneous decreases in actual emissions if the decreases are not creditable. The auditor must know how "contemporaneous" is defined by each audited agency. Contemporaneous emission decreases should be surplus and should not credited more than once. No decrease previously relied on by a PSD source can be considered again in determining the net change of a current or future modification. For nonattainment areas, any required emission reduction that has occurred or is scheduled to occur pursuant to the attainment date contained in and required by the SIP control strategy cannot be counted for netting purposes.

Finally, in nonattainment situations, no reduction relied on previously to meet the reasonable further progress requirement of Part D of the Clean Air Act can be used for calculating emissions. If necessary, the auditor should inquire about the agency's policy and procedure for preventing double counting, but documentation in the file which specifically states that the decrease was not relied on or counted elsewhere is preferable and should be encouraged. Should documentation not be readily available, the auditor should so indicate.

6.3.5 Emission Limits

Agencies may vary in the number of permits that they issue to a source having more than one emission unit. No Federal requirements exist to govern the number of permits which may apply to any source. What is important, however, is that each emission unit is identified clearly, along with its allowable emission rates, or design, equipment, work practice or operational standards, as may be appropriate to address each pollutant emitted. "Appropriate" often means having more than one limit for each pollutant. For example, there may be limits for the same pollutant to ensure compliance with (a) an NSPS (e.g., lb/million btu, rolling 30-day average), (b) 3-hour, 8-hour, or 24-hour NAAQS or PSD increments (e.g., lb/hour), (c) a restriction on capacity or operating hours (e.g., lb/day), and (d) an applicability determination or an annual NAAQS (e.g., ton/year). As a minimum, the permit should contain sufficient emission limits to ensure adequate control of all regulated pollutants which the source has the potential to emit in significant amounts.

It is particularly important, when an agency issues one permit to a large complex, that each emission unit is identified separately, along with its allowable emission rate, as opposed to a single composite emission rate for each pollutant. The auditor should verify that, for each permit issued, there is separate and clear identification of the affected emission units and their corresponding allowable emissions. Also, the auditor should insure that the averaging time for each standard be consistent with the averaging time for each NAAQS or PSD increment which is to be protected.

In addition to identifying the allowable emissions, equipment or other standard for each separate emission units, it is important that such limitations be addressed adequately in conditions on the permit(s) for a new or modified source. The auditor should examine the adequacy of the conditions in terms of their clarity and enforceability. The auditor should pay close attention to the use of clear and precise averaging periods over which the various pollutant emissions are to be measured. [Note: In many cases, averaging periods may be a part of the required test method and may not be specifically stated on the permit. In such cases, auditors should discuss this with the audited agency and verify that the agency regulations do require proper averaging periods by reference. Also, some agencies may incorporate by reference the test method as well as the averaging period.] Finally, the emission rates must be consistent with acceptable measurement procedures; otherwise, compliance will be difficult if not impossible to ascertain and the conditions would be unenforceable.

Test methods used to determine compliance of the source with its allowable emission rates should be clearly defined or referenced as conditions to the final permit. These compliance tests should be specific to the individual emission units to which they apply. The auditor should verify the documentation of the compliance test methods and their adequacy for covering each applicable emission unit for which allowable emission rates are defined. Where test methods are not specified in the permit, the auditor should determine whether the SIP specifications are otherwise applicable and sufficient. (This is likely to involve a discussion with Agency personnel.)

6.4 Control Technology--(Section IV.)

6.4.1 NSR/PSD Sources (Form 3).

The primary objective for the auditor is to determine whether good, well-supported, BACT/LAER determinations are being made. Secondary objectives are to measure the frequency of BACT/LAER determinations set equal to existing new source performance standards, and to determine the amount of legitimate attention being given by review agencies to the requirement for the application of LAER on new and modified major sources constructing in nonattainment areas.

Pollutants regulated under the Clean Air Act are subject to a BACT analysis if they would be emitted in significant amounts by a source whose construction is subject to PSD. A pollutant subject to regulation under the Clean Air Act generally has had a standard of performance under §111 or 112 and/or NAAQS promulgated for it. The analysis for the subject source should address both fugitive and nonfugitive emissions. The auditor should verify that the BACT analysis considers all significant emission increases rather than being restricted to criteria pollutants or major emission changes. Consistent with the North County Remand, the auditor should confirm that toxic air pollutants are addressed in the BACT determination.

In selecting BACT, the applicant generally should be required to consider more than one control strategy, unless it can be demonstrated that the single proposed strategy clearly represents the highest degree of continuous emission reduction available. In all cases, the control strategies considered should be technically feasible and should address the economic, energy and environmental impacts of the particular alternative. Quantifiable impacts should be identified. The auditor should verify that adequate alternative control strategies are included where appropriate.

In each case, the BACT analysis submitted by the applicant must be reviewed independently by the permit agency. In particular, candidate control equipment should be assessed to ensure that reasonable performance claims, including consideration of continuing compliance, are being made. Atypically high control efficiencies should be examined for their reasonableness, particularly where they would result in emission rates that would enable the applicant to avoid a certain requirement or to meet ambient constraints. Where the alternative representing the most stringent emission reductions is not selected, the permit agency should review carefully the alternatives to ascertain that the most appropriate one was selected. The agency should routinely check to see whether any technically feasible alternatives were not considered, and why. The auditor should verify that the agency performs an adequate independent review of the BACT analysis submitted by the applicant.

For each permit reviewed which was subject to BACT or LAER, the auditor should note the regulatory baseline assumed by the review agency. In how many instances do the agency's BACT/LAER determinations conform exactly to existing SIP, NSPS, or NESHAP requirements? The auditor should verify that adequate documentation is provided for those determinations which simply meet the minimum requirements. For cases where LAER determinations conform exactly to NSPS, the auditor should examine the reasons why LAER was not determined to be a more stringent limitation.

There has been a large change in EPA policy concerning BACT determinations. A memorandum from Craig Potter, dated December 1, 1987, states that EPA now wants reviewing authorities to use the "top-down" approach for BACT determinations. The first step in this approach is to determine, for the emission source in question, the most stringent control technology available. If it can be shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. The EPA is supposed to be doing this analysis for all permitting actions and States that have the PSD program by delegation are also supposed to be incorporating this method into their control technology evaluations. Although EPA can only encourage States with PSD SIP's to use the "top-down" method for BACT determinations, the December 1, memorandum states that "A final BACT determination which fails to reflect adequate consideration of the factors that would have been relevant using a "top-down" type of analysis shall be considered deficient by EPA." An auditor that discovers such a deficient permit should notify the reviewing authority and make note of it on the audit report.

6.4.2 Non-NSR/PSD Sources (Form 4).

For sources that are not subject to PSD or Part D control technology requirements, i.e., BACT or LAER, it is still important for the reviewing agency to address a number of control technology considerations. Methods of reducing emission should be checked for the reasonableness of the performance claims associated with them. This is especially true when the applicant intends to avoid major review by demonstrating that emission levels will fall below the major source threshold levels.

Sources that do not qualify for major review under PSD or Part D may still be subject to NSPS or NESHAP requirements for certain pollutants. Auditors should determine whether each source was adequately reviewed for such applicability regardless of its major source status.

6.5 Air Quality Monitoring Data (PSD)--(Section V. Form 3 only)

Every PSD source with the potential to emit significant amounts of a particular criteria pollutant, where both the existing air quality and the estimated impact of the source or modification are significant, must meet the requirements for preconstruction air quality monitoring data, unless exempted under provisions for temporary emissions or compliance with the Offset Policy. In the latter case, which applies only to VOC emissions, if the source satisfies all conditions of the emission e, postapproval monitoring may be provided in lieu of providing preconstruction data [40 CFR 51.24(m)(1)(v)]. Only PSD sources are required to submit such data. For PSD sources not required to submit ambient data, the applicable exemption should be clearly stated in the preliminary determination.

The requirement for ambient air quality monitoring data may be met in one of two ways. First, the permitting agency may require that the PSD applicant establish a monitoring network designed to collect the appropriate air quality data. Second, if existing air quality data is representative of the air quality in the area where the source would have an impact, then such representative data may be provided in the place of monitoring data collected by the applicant.

The Ambient Monitoring Guidelines for PSD contain minimum quality assurance requirements that must be met by the applicant when monitoring must be performed. The detailed criteria for quality assurance generally should not be audited by the new source review auditors. Instead, the Regional ambient monitoring staff is usually better able to audit the quality assurance procedures. It is important that the two groups discuss in advance the division of responsibility of audited areas, to avoid overlap or omissions. The new source review auditor should determine: (1) whether a monitoring plan was submitted by the source and evaluated by the permitting agency; (2) whether a quality assurance plan was submitted by the applicant; and (3) whether the permitting agency evaluated the data for compliance with 40 CFR 58 Appendix B.

Use of representative data is restricted by the criteria described in EPA's "Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)," EPA-450/4-80-012, Revised February 1981. Generally, only new sources in remote areas may use existing data gathered at sites greater than 10 km away. For all sources in flat terrain, monitors within 10 km are acceptable. For complex terrain, the guidelines are very difficult to meet, and new data are almost always required. In addition to the monitor location criteria, there are also restrictions concerning data currentness and quality. The auditor should be familiar with the guidelines concerning representative data and verify that the audited agency is following them.

6.6 PSD Increment Analysis--(Section VI. Form 3 only)

Before a permit is granted, the permit agency must determine that no national ambient air quality standards will be violated. In the special case of a PSD permit, the agency must further verify that no allowable PSD increment will be exceeded by the source under review. In all cases, the ambient impact analysis must be reviewed carefully by the permit agency responsible for managing the ambient air quality. The auditor should determine the adequacy of the ambient air analysis performed as part of the preconstruction review. In most cases the auditor for these sections should be the regional meteorologist or a modeling expert.

Allowable PSD increments exist only for SO_2 and TSP at the present time. There are a number of important considerations that the permit agency must routinely take into account in order to ensure that the maximum allowable increments are not exceeded. The permit agency must give the proper attention to such things as the baseline concentration, baseline area and baseline date(s); the appropriate emission changes for increment consumption purposes; long and short-term increment averaging periods; and special Class I area impacts.

The baseline concentration generally reflects actual emissions occurring at the time of receipt of the first complete PSD application in the §107 attainment or unclassifiable area. This ambient concentration is adjusted to include projected emissions of major sources commencing construction before January 6, 1975, but not in operation as of the baseline date, and to exclude the impacts of actual emission changes resulting from construction at a major stationary source commencing after January 6, 1975.

Changes in emissions contributing to the baseline concentration from any source subsequent to the baseline date and from any major source construction commenced after January 6, 1975, can either consume or expand the PSD increment. Where actual emissions cannot be used, e.g., the source has not yet begun to operate or sufficient operating data is not available, then allowable emissions must be used. The auditor should verify that the agency considers the appropriate emission changes relative to the baseline concentration.

The date of receipt of the first complete application for a major new source or major modification subject to PSD becomes the baseline date, and the area in which the baseline is triggered is known as the baseline area. The analysis can become somewhat complicated when the baseline area for the proposed source includes more than one Section 107 attainment or unclassified area, particularly if the baseline date has already been triggered in some, but not all, of the Section 107 areas within that baseline area. Auditors should be familiar with the PSD increment analysis process to help alleviate some of the potential confusion that could occur during the review of the PSD permit files. A good presentation of the increment analysis is contained in the EPA PSD Workshop Manual (EPA-450/2-80-081, October 1980).

Both TSP and SO_2 have long and short-term averaging periods for which PSD increments have been established. These maximum allowable increases are not to be exceeded more than once per year for other than an annual averaging period. The auditor should verify that each PSD application considers all appropriate averaging periods with complete documentation in the permit file.

For sources proposing to locate near a Class I area, an increment analysis may be required under conditions that would not trigger an analysis in any other locations. Any emissions from a proposed source should be considered significant when the source would locate within 10 km of the Class I area and cause an ambient impact equal to or greater than 1 ug/m^3 (24-hour average). Generally, sources locating within 100 km of a Class I area should be screened to determine their impact on the Class I area. All Class I analyses, of course, should also include any impacts on visibility.

6.7 NAAQS Protection--(Section V. Form 4; Section VII. Form 3)

States may differ as to the emission baseline used to protect the NAAQS. In some cases, the allowable emissions (or some other "representative" emission estimates) from all major sources are used for modeling air quality. In other cases, the modeled allowable emissions from the proposed source or modification are added to the background air quality which is based solely on monitoring data. The auditor should identify the emission baseline required by the agency and gain an understanding of the specific approach utilized to estimate the impact of a new or modified source. This information will be used to assess current practices and for consideration of future policy development.

In evaluating the NAAQS, the ambient impact analysis should determine the maximum long-term and short-term impacts of the proposed new source or modification. However, maximum ambient impact may actually occur at other locations when the impacts of other sources and background data are taken into account. Hot spots may also occur where growth resulting from minor sources or sources otherwise exempted from detailed permit review are not subjected to a rigorous ambient analysis. The auditor should verify that the agency performs a detailed analysis of a source's maximum ambient impact beyond those areas of maximum impact of the source alone.

EPA has recommended the use of a number of models for specific types of applications and has stated its preference for certain new models for analyzing the impact of sources on ambient air quality. However, utilization of any particular model should be consistent with the design and intent of the model itself. Some models are very specific as to terrain and applicability. The auditor should verify that impact analyses are being performed with the appropriate models, and that the permit agency conducts its own independent review of the source's analysis (including the replication of modeling results when appropriate) to ensure conformance to accepted procedures. EPA guidance is provided in "Guideline on Air Quality Models," EPA-450/278-027, April 1978. This report is currently undergoing revision. Additional guidance is also provided in "Regional Workshops on Air Quality Modeling: Summary Report," OAQPS, April 1981 and "Guideline for Use of City-Specific EKMA in Preparing Ozone SIP's," EPA-450/4-80-027, March 1981. EPA's "Guideline on Air Quality Models" includes, among other things, guidance on the selection of air quality dispersion models.

6.8 Emission Offset Requirements--(Section VIII. Form 3 only)

Part D of the Clean Air Act intends that certain stringent requirements be met by major sources approved for construction in nonattainment areas. One such requirement calls for the proposed source or modification to get emission reductions (offsets) from existing sources in the area such that there will be reasonable further progress toward attainment of the applicable NAAQS. The specific audit objectives are: (1) to assure that reviewing agencies are requiring, where appropriate, adequate emission offsets as a condition to authorizing major construction in designated nonattainment areas; and (2) to assure that emission offsets are being obtained in a manner consistent with RFP.

All emission reductions used to offset proposed new emissions must be made enforceable. This is true whether the offsets are obtained from another source owned by the applicant or from a source not under common ownership. In either case the offsets should be fully agreed upon and documented, preferably within the permit of the source from which the offset is obtained. In addition, Federal enforceability requires that an external offset be made a part of the applicable SIP. This would require a specific SIP revision if the offset is not made part of a permit issued pursuant to the State's construction permit requirements approved pursuant to 40 CFR 51.18 or 51.24 (now numbered 40 CFR Part 51, Subpart I). Conditions to State or local operating permits are not always considered to be part of the applicable SIP(s). The auditor should verify that all offsets are documented by means of well-defined emission limits pertaining to the emission offset.

The proposed *emissions offset* cannot be otherwise needed to show RFP toward attaining the NAAQS. To use the same emission offset for two different purposes would result in "double counting" those emissions with the net result being subsequent deterioration of air quality. The auditor should seek assurance from the agency that compliance with annual RFP increments is independent of the offsets being obtained from proposed new or modified sources. In addition, the permit file should be checked to determine whether any documentation is provided to address this issue. All findings sould be recorded in Form 3.

In order for the system for getting offsets to be consistent with the demonstration of reasonable further progress, both should be expressed in the same emission terms, i.e., actual or allowable emissions. Section 173(1)(A) of the Clean Air Act sets the emission offset baseline as the "allowable" emissions of the source, but also requires that the offsets must be sufficient to represent RFP. Consequently, where the RFP demonstration is based on an inventory of *actual* emissions, EPA requires that offsets to be attained by a proposed new or modified source also be based on *actual* emissions. Form 3 requires that the auditor determine whether there is consistency in the emission baseline for offsets and the RFP demonstration.

In order to comply with the Act requirement that emission offsets must be sufficient to represent RFP, any increases in area and minor source growth not considered in the approved RFP demonstration must be covered by offsets required of the proposed new or modified source. Failure to account for these emission increases would result in air quality deterioration just as in the case of "double counting." The auditor should verify that area and minor source growth considerations are made in order to establish the offset level, particularly when more than one year has passed since the last offset.

Section 173(1)(A) of the Clean Air Act requires that offsets be obtained and in effect "by the time the [new or modified] source is to commence operation." No specific guidance is available to identify when a source has officially "commenced" operation. Some agencies may allow a shakedown period similar to the shakedown provision allowed for net emission increases in 40 CFR 51.18(j)(1)(vii)(f) [now numbered 51.165(a)(1)(vii)(f)]. The auditor should focus primarily on whether offsets were sought to be in effect in a timely manner, which may include, for replacement facilities, a shakedown period not to exceed 180 days. The auditor should also determine whether the effective date for the offsets is documented in the permit file(s).

TABLE 1

REFERENCE TABLES
FOR USE WITH FY 1988-1989 NSR AUDIT QUESTIONNAIRES

I. Questionnaire abbreviations:

- CBD = cannot be determined from information available in permit file
- NA = not applicable
- PSD = prevention of significant deterioration
- Part D = nonattainment area provisions applying to sources which emit a nonattainment pollutant and locate within that nonattainment area.

II. Pollutant Criteria

	Pollutant	Use this Abbreviation	Significant Emission Levels, TPY	Significant Air Quality Concentrations (for Monitoring Determinations), ug/m^3
CRITERIA	Carbon monoxide	CO	100	575, 8-hr avg
	Nitrogen oxides	NO_x	40	14, annual avg
	Sulfur dioxide	SO_2	40	13, 24-hr avg
	Particulate matter:	TSP (or PM)	25	10, 24-hr avg
		PM_{10}	15	10, 24-hr avg
	Ozone (as volatile organic compounds)	VOC	40	(100 TPY of VOC)
	Lead	PB	0.6	0.1, 3-month avg
REGULATED	Asbestos	AB	0.007	No monitoring required
	Beryllium	BE	0.0004	0.001, 24-hr avg
	Mercury	HG	0.1	0.25, 24-hr avg
	Vinylchloride	VC	1.0	15, 24-hr avg
	Fluorides	FL	3	0.25, 24-hr avg
	Sulfuric acid mist	SAM	7	No monitoring required
	Hydrogen sulfide	H2S	10	0.2, 1-hr avg
	Total reduced sulfur	TRS	10	No monitoring required
	Reduced sulfur compounds	RSC	10	No monitoring required
	Radionuclides	RN	*	*
	Benzene	BZ	*	*
	Arsenic	AS	*	*

NOTE: For each regulated pollutant, any emission rate is significant that causes an air impact of 1 ug/m^3 (24-hr) or greater in any Class I area located within 10 km of the source. Air toxics emitted in sufficient amounts to be of concern should also be indicated, even though not directly regulated.

* These values have not been determined as of the time this audit guidance was written.

III. The following source categories are major if >100 TPY, including fugitive emissions. (One exception exists; see note for last source category in list.)

Coal cleaning plants (with thermal dryers)
Kraft pulp mills
Portland cement plants
Primary zinc smelters
Iron and steel mills
Primary aluminum ore reduction plants
Pimary copper smelters
Municipal incinerators > 250 TPY
Hydrofluoric, sulfuric, or nitric acid plants
Petroleum refineries
Lime Plants
Phosphate rock processing plants
Coke oven batteries
Sulfur recovery plants
Carbon black plants (furnace process)
Primary lead smelters
Fuel conversion plants
Sintering plants
Secondary metal production plants
Chemical process plants
Fossil-fuel boilers (or combination thereof)
  totaling > 250 million BTU/hr heat input
Petroleum storage & transfer units with total
  storage capacity > 300,000 bbls
Taconite ore processing plants
Glass fiber processing plants
Charcoal production
Fossil fuel-fired steam electric plants
  > 250 million Btu/hr heat input
Any other NSPS or NESHAP source as of
  August 7, 1980 [Note: for PSD, major
  source status based on emissions >250 TPY.]

Form 1

NSR PERMIT SUMMARY
QUESTIONNAIRE

I. GENERAL INFORMATION

AUDIT PERIOD: __/__ to __/__
Mo.Yr. Mo.Yr.

REGION:

STATE:

☐ State ☐ Local Agency

AGENCY NAME:

Please answer the questions below for the specified audit period based on the number of construction permits that you (the above-named State or local agency) issued to sources (major and minor) in your jurisdiction. Use the accompanying list of instructions to formulate your responses.

II. PERMIT SUMMARY

1. PSD and Part D (Offset) Construction "Permits"
   - a. _____ Prevention of significant deterioration (≥ 100 or 250 TPY)
   - b. _____ Part D major sources in nonattainment areas (≥ 100 TPY)
   - c. _____ Combination (i.e., PSD and Part D)
   - d. _____ TOTAL (a + b + c)
2. Other Source Construction "Permits"
   - a. _____ Non-PSD permits (≥100 TPY) in attainment/unclassified areas
   - b. _____ Minor sources (<100 TPY)
     - i. _____ Minor sources undergoing ambient impact analysis
     - ii. _____ Sources avoiding major source review via restrictions not otherwise required but imposed to lower source's potential to emit.
   - c. _____ TOTAL (a + b)

III. PRECONSTRUCTION MONITORING FOR PSD

_____ No. of PSD sources subject to preconstruction monitoring requirements.

_____ No. of PSD sources actually required to collect data via monitoring.

_____ No. of PSD sources allowed to use existing representative data.

INSTRUCTIONS FOR FORM 1

INSTRUCTIONS

I. GENERAL INFORMATION

° This section should be filled out by the EPA Regional Office before forwarding the questionnaire to the audited agency. The audit period represents the period from the time of the last audit.

II. PERMIT SUMMARY

° Major source permits: enter "N/A" if you do not have program authority; "0" if you have authority, but no permits of a particular type were issued.

° "Permit" should be defined in terms of the entire source or project for which a particular construction approval (for a new source or modification) was requested. Consequently, one application should generally be regarded as a "permit" regardless of the number of agency permits (for individual emission units) actually issued. For cases where an application would qualify for two permit groupings (e.g., major source review for both PSD and offsets), the permit should be listed under II.1.c.

° All "permit" numbers reported should pertain to new construction (which may involve a completely new plant or a modificatin to an existing one) or a new method of operation for which a permit analysis was required. Permit extensions, minor revisions, etc., should not be included. If the exact number of "permits" is not known, please provide your most reasonable estimate and place an "(E)" after the value provided.

° If EPA performs the application review and issues a PSD permit (i.e., the State or local agency does not have either a SIP approved PSD program or delegated authority), do not include such "permit" in line 1.a. However, if a permit is required by the State or local agency in addition to EPA's PSD review, then that permit should be included in line II.2.a. Also, use line II.2.a. to account for permits issued to major ($\geq$ 100 tpy) new or modified sources which are not subject to PSD because their emissions are less than the 250 tpy cutoff for unlisted PSD sources.

° Sources may avoid major source review by agreeing to limitations which would restrict their potential emissions to an amount below the 100 or 250 tpy threshold. This is often accomplished by limiting the source's hours of operation, fuel use, or operating rate via Federally enforceable permit conditions. If this occurs, it should be noted in line II.2.b.ii.

III. PRECONSTRUCTION MONITORING FOR PSD

For sources subject to PSD monitoring, indicate number of sources for which (a) ambient monitoring was required, or (b) the use of existing data was allowed. For cases where a PSD source is required to monitor for one or more pollutants, but is also allowed to use existing representative data for another pollutant, the source should be counted once for each event. Therefore, sources may be double counted under III.1.a. and b.

FORM 2

NSR AUDIT SUMMARY QUESTIONNAIRE

I. GENERAL INFORMATION: AUDIT PERIOD: __/__/ to __/__
Mo.Yr. Mo.Yr.

REGION:

STATE: ☐ State Agency ☐ Local Agency

II. NUMBER OF PERMITS AUDITED

Indicate the number of permit files audited (including those for which a questionnaire was not completed) for each of the following types of permits:

a.___ PSD only b.___ Part D only c.___ PSD/Part D d.___ all other

III. TIME REQUIRED TO AUDIT PERMITS

Indicate the amount of time, in hours, spent auditing the total number of permits specified above, as well as the range in time needed for auditing individual permits for which a questionnaire was completed. (Times should be stated to the nearest half hour.)

a.______ Hours for total audit of files.

b.______ Hours for maximum single file audit.

c.______ Hours for minimum single file audit.

IV. PERMIT SELECTION

a. The audited agency [ ] was [ ] was not told prior to the audit which permits would be examined.

b. The audited agency [ ] did [ ] did not participate in the selection of permits which were audited.

Comments - ____
____
____

Form 2 (continued)

V. CONDITION OF PERMIT FILES

For the two categories specified below, mark the response that best describes the condition of the audited agency's permit files:

a. Organization - ☐ Information in each file well organized.

☐ Information available but not well organized; did/did not (circle one) significantly lengthen the time required to audit files.

☐ Information not contained in a central file, but maintained in separate files; did/did not (circle one) have opportunity to examine all pertinent information.

Comments - ____

____

____

b. Documentation - ☐ All files reviewed contained necessary documentation.

☐ Some (____%) files reviewed contained necessary documentation.

☐ Files reviewed typically lacked necessary documentation.

Comments - ____

____

____

VI. SIGNIFICANT PROBLEMS

a. List the five (or fewer) most significant problems found as a result of the NSR audit. Start with the most significant problem and continue listing in descending order. [Each problem listed should be supported by discussion contained in the audit narrative.]

i. ____

ii. ____

iii. ____

iv. ____

v. ____

Form 2 (continued)

b. For each problem identified on previous page, select the reason(s) which you believe may contribute to the particular problem:

	(i)	(ii)	(iii)	(iv)	(v)
° Inadequate agency procedures	☐	☐	☐	☐	☐
° Failure of agency to follow its own procedures	☐	☐	☐	☐	☐
° Inadequate agency rules/regulations	☐	☐	☐	☐	☐
° Inadequate agency resources/ organization	☐	☐	☐	☐	☐
° Need for EPA policy or guidance	☐	☐	☐	☐	☐
° Other: Specify____________________	☐	☐	☐	☐	☐

Comments - ____

____

____

VII. PROGRAM IMPROVEMENTS

Briefly describe below program improvements that have occurred since the last NSR audit. These should also be discussed in full detail in the narrative report. The improvements generally should relate to specific audit findings identified during previous audits.

FORM 3

PERMIT FILE QUESTIONNAIRE FOR MAJOR SOURCES SUBJECT TO PSD OR PART D (OFFSETS)

[NOTE: Unless otherwise indicated place an "X" in the box beside each statement or response which applies. Many of the questions will allow more than one response.]

SECTION I. SOURCE INFORMATION

A.1. Company/Source Name: ______________________________

2. Source type/Category and capacity: ______________________

3. Location: ______________________

B. 1. Region ☐☐

2. State ☐☐

3. Permitting Agency
   a. ☐ State
   b. ☐ Local: _______

4. Auditor ___________

5. Permit # ___________

6. Type of Review:
   a. ☐ New Major Source
   b. ☐ Major Modification

C. Date Application Considered Complete

☐☐ ☐☐ ☐☐
mo day yr

D. Date Permit to Construct Issued:

☐☐ ☐☐ ☐☐
mo day yr

E. This permit was reviewed for (list pollutants):
1. Attainment area pollutants
   ☐ PSD for: ___________
2. Nonattainment area pollutants
   ☐ offsets for: ___________
   ☐ Growth allowance for: ___________
3. Toxic air pollutants: ___________

F.1. ☐ This source is located within 10 km of a Class I area.
2. ☐ This source is located within 100 km of a Class I area.
3. ☐ Source is in an attainment area and significantly impacts a designated nonattainment area or any area where a NAAQS violation exists.
4. ☐ Construction ban for some pollutants.
5. ☐ None of the above.

SECTION II. PUBLIC PARTICIPATION REQUIREMENTS

A. Public Notice:	YES	NO	CBD
1. was published in a newspaper (approx. cost: $______)	☐	☐	☐
2. provided opportunity for public hearing	☐	☐	☐
3. provided opportunity for written comment	☐	☐	☐
4. described agency's preliminary determination	☐	☐	☐
5. included estimated ambient impact	☐	☐	☐
6. indicated addt'l info. available for inspection . . .	☐	☐	☐

Form 3 (continued)

B. The following other affected government agencies were notified:

	YES	NO	CBD
1. other agencies and officials within the State	☐	☐	☐
2. other States	☐	☐	☐
3. Federal Land Manager	☐	☐	☐
4. EPA	☐	☐	☐

C. Documentation for parts A and B consists of:

	Public Notice	Notification of Other Agencies
1. copy of notice/correspondence in file	a.☐	b.☐
2. indication on processing checklist	a.☐	b.☐
3. no documentation provided	a.☐	b.☐

4. other, explain: ______________________________

Section III. APPLICABILITY DETERMINATIONS

A. Definition of Source.

1.a. The new source or modification for which this permit application was made was considered by the reviewing agency to consist of the following new and modified pollutant-emitting activities associated with the same industrial grouping, located on contiguous or adjacent sites, and under common control or ownership (if more than 5, list only 5 largest):

☐ using a plantwide definition
☐ using a dual source definition
☐ using another definition

New	Modif.	Emission Unit/Size	Pollutant
☐	☐		
☐	☐		
☐	☐		
☐	☐		
☐	☐		

b. ☐ CBD

Form 3 (continued)

2. Were any new or modified pollutant-emitting activities (other than fugitive emissions) omitted which should have been included:

☐ NO. ☐ CBD. ☐ YES, as follows:

Emission Unit/Size	Emission Pollutant	TPY	New	Modif.	Reason given by agency for not considering as part of source
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	

3. If yes was checked for Section III.A.2.c. above, did this new source or modification escape any PSD or Part D analyses for significant emissions as a result of the omission of the listed activities?

☐ Yes ☐ No

B. Fugitive emissions.

1. This source or modification:

a. ☐ Does not have any quantifiable fugitive emissions. (GO TO Section III.C.)

b. ☐ Has too little documentation in the file to determine whether quantifiable fugitive emissions were included in the emission estimates.

c. Has quantifiable fugitive emissions which were:

i. ☐ Included in determining whether the source/modification was major for the following pollutants: ______________________ ____.

ii. ☐ Not included in determining whether the source was major for the following pollutants: ____________________________ ____ because the source is neither one of the 28 PSD source categories nor regulated under Section 111 or 112 of the Act.

iii. ☐ Not included in determining whether the source was major for the following pollutants: ______________________________, although they should have been.

Form 3 (continued)

C. Potential to Emit (PTE). The determination of whether a source is major should be based on PTE which, because most sources do not operate 8,760 hours per year at 100% capacity, can differ greatly from actual emissions.

1. The emissions of this source or modification were determined:

   a. Using emission rates based on emission factors which were:

      i. [ ] Well established (e.g., AP-42) or well documented in the file.

      ii. [ ] Not well established and lacking adequate documentation for the following units and pollutants: ____________________

      ____

      ____

   b. [ ] CBD

   c. [ ] Using another method. Explain: ____________________________

   ____

2. The emissions of this source were determined on the basis of:

   a. [ ] CBD; GO TO C.3.

   b. [ ] Maximum capacity to emit at full physical and operation design; GO TO C.3.

Form 3 (contined)

c. [ ] Limited capacity based on control equipment, or physical, operational or emission limitations, not otherwise required (e.g., NSPS), as follows:

			If used, was limitation identified on:				
			Constr. Permit		Operating Permit		
	Limitation	Pollutants	Yes	No	Yes	No	NA
i.	[ ] Control equipment*	_______	[ ]	[ ]	[ ]	[ ]	[ ]
ii.	[ ] Emission limit*	_______	[ ]	[ ]	[ ]	[ ]	[ ]
iii.	[ ] Operating hours	_______	[ ]	[ ]	[ ]	[ ]	[ ]
iv.	[ ] Operating rate	_______	[ ]	[ ]	[ ]	[ ]	[ ]
v.	[ ] Fuel/material restriction	_______	[ ]	[ ]	[ ]	[ ]	[ ]
vi.	[ ] _______________	_______	[ ]	[ ]	[ ]	[ ]	[ ]

*Not otherwise required, i.e., main purpose of limitation is to reduce potential emissions.

If Section III.C.2.c. above is marked, please describe the limitations:

____

____

____

3. Do the calculated emissions correctly represent the source's potential emissions?

a. [ ] YES

b. [ ] CBD

Explain: ____

c. NO, because:

i. [ ] calculations based on control equipment, or physical, operational or emission limitations that are not Federally enforceable

ii. [ ] emission factors not acceptable

iii. [ ] did not adequately address fugitive emissions

Form 3 (contined)

iv. [ ] did not address all pollutant-emitting activities (other than fugitives)

Explain: ______________________________

v. [ ] other. Explain: ______________________________

D. Emission Netting.

1. Check the appropriate box for this permit action:

a. [ ] New source; emission netting not applicable. GO TO Section III.E.

b. [ ] Major modification

2. The determination of significant emissions can be a complex process when emission netting occurs. The following work sheet should be used to determine whether the proper procedure was followed:

Pollutant	Proposed Emission Changes, TPY (+)	Other creditable, contemporaneous emissions changes, TPY (+)	(-)	Overall Net Change, TPY
a. TSP	___	___	___	___
b. PM_{10}	___	___	___	___
c. SO_2	___	___	___	___
d. NO_x	___	___	___	___
e. O_3 (VOC)	___	___	___	___
f. CO	___	___	___	___
g. ______	___	___	___	___
h. ______	___	___	___	___

3. Did agency correctly identify whether emissions were significant?

[ ] Yes [ ] CBD [ ] No; Explain ______________________________

____

4. Did analysis consider all pollutants for which a net increase in emissions occurred?

[ ] Yes

[ ] No, failed to address one or more pollutants. Explain: ________

____

[ ] CBD; Explain ______________________________

Form 3 (continued)

COMPLETE THE FOLLOWING APPLICABLE STATEMENTS.

5.a. Emission netting was based on actual emissions.

☐ CBD; GO TO Question 7. ☐ No; GO TO Question 6. ☐ Yes

b. Indicate whether the calculation of actual emissions properly considered the following criteria:

	Yes	No	CBD
i. Representative of normal unit operation	☐	☐	☐
ii. Based on a two-year average	☐	☐	☐
iii. Expressed in TPY	☐	☐	☐

6. Emission netting was based on another approach.

a. ☐ No.

b. ☐ Yes, and approach was acceptable. Explain: ________________
____

c. ☐ Yes, but approach was incorrect. Explain: ________________
____

7. Emission decreases were considered.

a. ☐ No; GO TO E.

b. ☐ Yes, and the decreases:

Were	Were not	CBD	N/A	
☐	☐	☐		a. Contemporaneous with the proposed modification.
☐	☐	☐		b. Previously relied on to determine a net emission change.
☐	☐	☐	☐	c. Previously counted as part of the SIP attainment strategy (Part D source only).
☐	☐	☐	☐	d. Previously relied on to meet the "reasonable further progress" requirement of Part D (Part D source only).
☐	☐	☐		e. Made Federally enforceable as permit conditions.

Form 3 (continued)

E. Emission limits.

1. Did the agency identify the appropriate allowable emission rates with respect to each emission unit?

☐ Yes ☐ No; explain: ______________________________

2. The number of limitations actually appearing or referenced in the construction permit is ________ (see worksheet for emissions unit).

3. How many of the limitations:

	Number		
	Yes	No	CBD
a. Include clear and concise averaging periods compatible with appropriate requirements (e.g., NSPS, short-term NAAQS)?	___	___	___
b. Are compatible with acceptable measurement techniques?	___	___	___
c. Consist of design, equipment, work practice, or operational standards?	___	___	___
d. Appear Federally enforceable?	___	___	___
e. Include stated or referenced compliance test methods?	___	___	___

SECTION IV. BACT/LAER DETERMINATIONS (☐ If not applicable, mark here, THEN GO TO SECTION V.)

A. BACT Analysis.

	TSP	PM_{10}	SO_2	VOC	NO_X	CO
1. Pollutant emitted in significant amounts.	☐	☐	☐	☐	☐	☐
2. BACT/LAER analysis made (indicate w/"B" or "L")	☐	☐	☐	☐	☐	☐
3. BACT/LAER was specified in permit.	☐	☐	☐	☐	☐	☐

	YES	NO	CBD
4. a. Did the application address more than one control option for BACT?	☐	☐	
b. If NO, was the selected BACT clearly acceptable?	☐	☐	☐

Comments: ______________________________
____

	YES	NO	CBD
c. If YES, did each option address the economic, and environmental impacts associated with that option?	☐	☐	

Form 3 (continued)

	Yes	No
5. Does the file contain documentation to show that the reviewing agency verified the applicant's calculations and assumptions for BACT/LAER?	[ ]	[ ]

B. BACT/LAER Stringency. (Use the appropriate symbol(s) below to answer this part.)

1. a. Was "top-down" used in determining BACT? [ ] YES [ ] NO [ ] CBD

   b. Was the final control technology chosen more stringent than BACT? [ ] YES [ ] NO [ ] CBD

   c. Comments:______________________________

2. Is the source (or modification) one for which NSPS or NESHAP has been established? [ ] No; GO TO Section V. [ ] Yes.

3. The Agency's BACT/LAER determination compared to NSPS/NESHAP is:

"A" -- more stringent

"B" -- equal

"C" -- less stringent

"D" -- did not address, but should have

"NA" -- not applicable

		BACT	LAER
1.	TSP	[ ]	[ ]
2.	PM_{10}	[ ]	[ ]
3.	SO_2	[ ]	[ ]
4.	HC	[ ]	[ ]
5.	NO_X	[ ]	[ ]
6.	CO	[ ]	[ ]
7.	____	[ ]	[ ]
8.	____	[ ]	[ ]

4. Were air toxics considered in determining BACT? [ ] YES [ ] NO [ ] CBD

SECTION V. AIR QUALITY MONITORING DATA -- PSD ([ ] If not subject to PSD, mark here, THEN GO TO Section VI)

A. Air Quality Monitoring Worksheet:

	Pollutant	(a) Are potential emissions significant?		For each "yes" in (a), complete the following: (b) Are modeled concentrations significant?			(c) Is existing air quality significant?		
		YES	NO	YES	NO	CBD	YES	NO	CBD
1.	TSP	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
2.	PM_{10}	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
3.	SO_2	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
4.	CO	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
5.	NO_X	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
6.	VOC/O_3	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
7.	________	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Form 3 (continued)

B. Applicability.

1. Was source required to address PSD air quality monitoring data requirements (either source monitoring or use of existing data)?

a. ☐ Yes, required to address air quality monitoring data requirements for at least one pollutant.

b. ☐ No, existing air quality for all pollutants was determined to be de minimis for all pollutants (GO TO SECTION VI).

c. ☐ No, proposed ambient concentration increases for all pollutants were demonstrated to be de minimis (GO TO SECTION VI).

d. ☐ No, for the following reason(s):

____

____

____

(GO TO SECTION VI)

C. Ambient Monitoring.

1. Was ambient monitoring required of applicant?

☐ No; GO TO D, below ☐ Yes

2. Did the applicant submit a monitoring plan, including quality assurance (QA) procedures?
   a. ☐ YES, for ________________
   b. ☐ NO, for ________________ GO TO Question 4
   c. ☐ CBD, for ________________ GO TO Question 4

3. Is the monitoring plan in the permit file?
   a. ☐ YES, for ________________
   b. ☐ NO, for ________________

4. For how long did the monitors collect air quality data?
   a. ☐ 12 months or more for: ________________
   b. ☐ 4 to 12 months for: ________________

   c. ☐ less than 4 months for: ________________
   If less than 12 months of data were submitted, summarize explanation: ________________________________

   ____

D. Representative Data

1. Was the use of existing data allowed?
   ☐ No, GO TO Section VI. ☐ Yes

2. Is the basis for allowing the use of existing data documented in the permit file?

   a. ☐ YES, for ____________________

   b. ☐ NO, for ____________________

3. a. Did the agency's determination of "representative" adequately consider:

	YES for:	NO for:	CBD for:
i. Location of existing monitors	☐ ____	☐ ___	☐ ____
ii. Quality of the existing air quality data	☐ ____	☐ ___	☐ ____
iii. Currentness of existing air quality data	☐ ____	☐ ___	☐ ____

   b. If "NO" for any pollutant, please explain: ____________________

____

____

____

SECTION VI. PSD INCREMENT ANALYSIS

A. Modeling Analysis

Note: It is important that an auditor knowledgeable in modeling techniques and required procedures participate in this portion of the audit.

	CLASS I		CLASS II	
	TSP	SO_2	TSP	SO_2
1. Was a PSD increment analysis performed?				
☐ NO, GO TO VI.D. ☐ YES, as follows. .	☐	☐	☐	☐
2. How was the analysis performed?				
☐ By the applicant with adequate review (including replication of results, if appropriate) by the agency for.	☐	☐	☐	☐
☐ By the applicant, without adequate agency for	☐	☐	☐	☐
☐ By the reviewing agency for	☐	☐	☐	☐
☐ Not applicable for.	☐	☐	☐	☐

Form 3 (continued)

3. Identify the dispersion model(s) used to perform the increment analysis:

Model Used	Pollutant/Area Classification	Averaging Times		
		3hr	24hr	Annual
(Identify one model per line)				
a. ______________	☐ SO_2 for ☐ Class I ☐ Class II ☐ TSP for ☐ Class I ☐ Class II	☐	☐ ☐	☐ ☐
b. ______________	☐ SO_2 for ☐ Class I ☐ Class II ☐ TSP for ☐ Class I ☐ Class II	☐	☐ ☐	☐ ☐
c. ______________	☐ SO_2 for ☐ Class I ☐ Class II ☐ TSP for ☐ Class I ☐ Class II	☐	☐ ☐	☐ ☐

d. ☐ CBD

4. Did the agency select appropriate model(s)?

	FOR MODEL (see A.3. above)		
	3.a	3.b	3.c
☐ a. Yes, and documentation supports use of each model as being appropriate.	☐	☐	☐
☐ b. Yes, model was appropriate, but inadequate documentation was available to explain its selection.	☐	☐	☐
☐ c. Cannot be determined. Documentation not provided to justify model selection.	☐	☐	☐
☐ d. No, documentation failed to address appropriate considerations. Explain:______ ____ ____	☐	☐	☐

5. Did the agency exercise the appropriate model options (urban/rural, receptor network design, wind speed profiles, building wake effects, final/gradual plume rise, etc.)?

	FOR MODEL		
	3.a	3.b	3.c
☐ a. Yes, and documentation supports use of options as being appropriate.	☐	☐	☐
☐ b. Yes, options were appropriate, but inadequate documentation was available to explain its selection.	☐	☐	☐
☐ c. Cannot be determined. Documentation not provided to justify options selection.	☐	☐	☐
☐ d. No. Explain: ______________________________ ____ ____	☐	☐	☐

Form 3 (continued)

6. Did analysis consider the appropriate meteorological data?

   ☐ 1. Yes, five consecutive years of the most recent representative sequential hourly National Weather Service data.
   ☐ 2. Yes, one year of NWS data (if 5 not available) + use of highest modeled results.
   ☐ 3. Yes, five years of on site data subjected to quality assurance procedures.
   ☐ 4. Yes, at least one year of hourly sequential on site data, including worst-case conditions and subjected to quality assurance procedures.
   ☐ 5. Yes, screening data were used to obtain conservative results.
   ☐ 6. No. Explain: ____

   ____

   ☐ 7. CBD

B. Baseline Area.

The baseline area for either TSP or SO_2 (or both) is defined as one or more designated attainment/unclassified (§107) areas and will include the §107 area the source will locate in, plus any other §107 areas where the pollutant impact exceeds 1 ug/m^3 annual average (1 ug/m^3, 24-hour average, for Class I areas).

1. Were §107 areas properly applied?

	TSP	SO_2
☐ a. Yes, the baseline area consists of all portions of the designated attainment/unclassified areas as listed in 40 CFR 81 Subpart C.	☐	☐
☐ b. No, the baseline area consists of only portions of the designated attainment/unclassified areas. Explain: ____________________	☐	☐
☐ c. Cannot be determined from available information.	☐	☐

2. Did the baseline area include any other areas besides the area in which the source would construct?

   ☐ a. No, file documentation demonstrated no significant impact beyond area where source would locate.
   ☐ b. No, but documentation was not provided to indicate whether other areas should have been included.
   ☐ c. Yes, for some of the ☐ TSP ☐ SO_2 attainment/unclassified areas in baseline area.
   ☐ d. CBD.

Form 3 (continued)

3. Did the source trigger the baseline date?

☐ a. Yes, for entire baseline area.
☐ b. Yes, for some of the ☐ TSP ☐ SO_2 attainment/unclassified areas.
☐ c. No, baseline date(s) for all areas within baseline area previously triggered.
☐ d. CBD.

C. Increment Consumption

1. Did the analysis include, where appropriate (or explain why not):

	TSP	SO_2
a. emissions from major sources commencing construction after 1/6/75 in determining increment consumed (PSD Workshop Manual, Pt I, Sec. C.2)?		
(i) Yes, for	☐	☐
(ii) No, for	☐	☐
(iii) No prior major source emissions consumed increment. for	☐	☐
(iv) CBD, for	☐	☐
b. emissions from minor sources occurring after the applicable baseline date(s) within the impact area in determining increment consumed?		
(i) Yes, for	☐	☐
(ii) No. Explain: ____________________________	☐	☐
(iii) Not applicable. Source triggered baseline	☐	☐
date	☐	☐
(iv) CBD, for	☐	☐

2. What impact concentrations were used for the short-term increments?

	Concentration Used		
	Highest of the		
Pollutant	Highest	2nd highest	Other (explain)
TSP	☐	☐	☐ ____________
SO_2	☐	☐	☐ ____________

D. Is there any reason to believe that an increment analysis should have been performed but was not?

		Increment	
☐ No.			
☐ Yes, as follows:	☐ TSP	☐ Class I	☐ Class II
	☐ SO_2	☐ Class I	☐ Class II

Explain each "yes": ____

SECTION VII. NAAQS PROTECTION

1. Was a NAAQS analysis performed?

☐ NO, GO TO Question 8
☐ YES, as follows:

Pollutant	Identify model used in the blanks below.		
a. ☐ TSP or ☐ PM_{10}		☐ 24hr: ______	☐ annual: ______
b. ☐ SO_2	☐ 3hr: ______	☐ 24hr: ______	☐ annual: ______
c. ☐ NO_X			☐ annual: ______
d. ☐ CO	☐ 1hr: ______	☐ 8 hr: ______	
e. ☐ O_3	☐ 1hr: ______		
f. ☐ Pb			☐ 3mos: ______

2. For the pollutants checked above, how was the analysis performed?

	FOR THESE POLLUTANTS:	
☐ a. by the applicant with adequate review (including replication of results, if appropriate) by the agency.	☐ all	☐: ______
☐ b. by the applicant without adequate review (including replication of results, if appropriate) by the agency. Explain: ______________________________ ______________________________	☐ all	☐: ______
☐ c. by the agency.	☐ all	☐: ______

3. Did the applicant/agency use the appropriate model(s) to complete the analysis?

	FOR THESE MODELS:	
☐ a. YES, and documentation supports use of the model(s).	☐ all	☐: ______
☐ b. YES, but inadequate documentation was available to explain its use.	☐ all	☐: ______
☐ c. CANNOT BE DETERMINED, documentation not provided to justify model selection.	☐ all	☐: ______
☐ d. NO, documentation failed to address appropriate considerations. Explain: ______________________________ ______________________________	☐ all	☐: ______

Form 3 (continued)

4. Did the applicant/agency use the appropriate model options (urban/rural, receptor network design, wind speed profiles, building wake effects, final/ gradual plume rise)?

	FOR THESE MODELS:
☐ a. YES, and documentation supports use of the option(s).	☐ all ☐: ________
☐ b. YES, but inadequate documentation was available to explain their use.	☐ all ☐: ________
☐ c. CANNOT BE DETERMINED, documentation not provided to justify model option selection.	☐ all ☐: ________
☐ d. NO, documentation failed to address appropriate considerations. Explain: ____________________	☐ all ☐: ________

5. Did the analysis consider appropriate meteorological data?

- ☐ a. YES, five consecutive years of the most recent representative sequential hourly National Weather Service data.
- ☐ b. YES, five years of on site data subjected to quality assurance procedures.
- ☐ c. YES, at least one year of hourly sequential on site data, including worst-case conditions and subjected to quality assurance procedures.
- ☐ d. Yes, one year of NWS data if 5 not available + use of highest modeled results.
- ☐ e. YES, screening data were used to obtain conservative results.
- ☐ f. NO. Explain: ______________________________________
  ____
- ☐ g. CBD

6. Is there sufficient information in the file to verify that emissions from the following stationary sources (including sources with permits, but not yet in operation) were adequately considered when appropriate?

	YES	NO	NA
a. Existing major stationary sources. Explain: ______________________________	☐	☐	☐
b. Existing minor and area stationary sources. Explain: ______________________________	☐	☐	☐

Form 3 (continued)

7. Did the analysis provide adequate consideration of multi-source pollutant interactions?

   ☐ a. YES, analysis adequately defined points of maximum impact determined from consideration of all sources in the vicinity rather than the maximum impact of the proposed source alone and the modeling exercise followed the guidance contained in the current Guideline on Air Quality Modeling.

   ☐ b. NO, analysis ignored significant emissions from other sources in the vicinity. Explain: ____________________
   ____.

   ☐ c. CBD.

8. Is there any reason to believe that one or more NAAQS analyses should have been performed but were not?

   ☐ CBD.
   ☐ NO.
   ☐ YES; explain. ____________________

VIII. EMISSION OFFSET REQUIREMENTS

A. Emission offsets:

   ☐ 1. were not applicable to this source. (GO TO SECTION IX.)

   ☐ 2. were applied to the following pollutants: ____________

   ☐ 3. should have been applied to the following pollutants: ____________

   ☐ 4. use cannot be determined from information in the file. Explain: ____________________
   ____

Form 3 (continued)

B. For the six questions below, identify the applicable pollutants, then use: "Y" for yes, "N" for no, "NA" for not applicable, or "CBD" in spaces below. (Note: You may need to consult the file for the source(s) from which the offsets are being obtained to be able to respond to the following questions.)

Information obtained from: (Check appropriate box, below)

	Pollutant			This Permit	Offset Source Permit	Other (Explain):
	(__)	(__)	(__)			
1. Emission offsets obtained by this source are expressed in the same terms (i.e. actual or allowable) as are those emissions used in the RFP demonstration.	___	___	___	☐	☐	☐ _______
2. Minor/area source growth was taken into account in determining the amount of emission offsets needed.	___	___	___	☐	☐	☐ _______
3. Offsets are surplus, i.e., would not interfere with RFP.	___	___	___	☐	☐	☐ _______
4. Offsets are Federally enforceable.	___	___	___	☐	☐	☐ _______
5. Offsets were required to occur on or before the dates of the start-up of the new or modified source.	___	___	___	☐	☐	☐ _______
6. Offsets were not utilized from early source shutdowns or production curtailments, except for replacements.	___	___	___	☐	☐	☐ _______

C. Comments: ____

____

____

Form 3 (continued)

SECTION IX. COMMENTS, NOTES

FORM 4

PERMIT FILE QUESTIONNAIRE
FOR SOURCES NOT SUBJECT TO PSD OR PART D (OFFSETS)

[NOTE: Unless otherwise indicated, place an "X" in the box beside each statement or response which applies. Many of the questions will allow more than one response.]

SECTION I. SOURCE INFORMATION

A.1. Company/Source Name: ______________________________

2. Source/type Category and Capacity ______________________

3. Address: ______________________________

C. Date Complete Application rec'd:

mo day yr

D. Date Permit to Construct Issued:

mo day yr

E. Source Location

1. [ ] Attainment/unclassified for all criteria pollutants

2. [ ] Nonattainment without construction ban for: ____________

B. 1. Region

2. State

3. Permitting Agency
   a. [ ] State
   b. [ ] Local: ________

4. Auditor ________

5. Permit # ________

6. Type of Review:
   a. [ ] New Source
   b. [ ] Modification

3. [ ] Nonattainment area subject to a construction ban for: ________

4. [ ] Within 10 km of a Class I area

SECTION II. PUBLIC PARTICIPATION REQUIREMENTS

A. Public Notice:

		YES	NO	CBD
1.	[ ] was not issued because exempted by agency rules. GO TO II.B.			
2.	[ ] was not issued, but agency rules do not exempt. GO TO II.B.			
3.	was published in a newspaper (approximate cost $______)	[ ]	[ ]	[ ]
4.	provided opportunity for public hearing	[ ]	[ ]	[ ]
5.	provided opportunity for written comment	[ ]	[ ]	[ ]
6.	described agency's preliminary determination	[ ]	[ ]	[ ]
7.	included estimated ambient impact.	[ ]	[ ]	[ ]
8.	indicated availability of additional information for public inspection	[ ]	[ ]	[ ]
9.	resulted in ____ comments ("0" if notice produced no comments)			

Form 4 (continued)

B. The following other affected government agencies were notified:

1. other agencies and officials within the State. . . . . ☐ ☐ ☐
2. other States . . . . ☐ ☐ ☐
3. Federal Land Manager . . . . ☐ ☐ ☐
4. EPA . . . . ☐ ☐ ☐

C. Documentation for Section II parts A and B consists of:

	Public Notice	Notification of Other Agencies
1. copy of notice/correspondence in file	a.☐	b.☐
2. indication on processing checklist*	a.☐	b.☐
3. no documentation provided	a.☐	b.☐

4. other, explain: ______________________________

* i.e., no copies, but some official indication in file that notice was provided

SECTION III. APPLICABILITY DETERMINATIONS

A. Definition of Source. The source or modification for which this permit application was made was considered by the reviewing agency to consist of:

1.a. ☐ The following new and modified pollutant-emitting activities associated with the same industrial grouping, located on contiguous or adjacent sites, and under common control or ownership (if more than 5, list only 5 largest):

New	Modif.		Emission Unit/Size	TPY/Pollutant
☐	☐	i.		
☐	☐	ii.		
☐	☐	iii.		
☐	☐	iv.		
☐	☐	v.		

b. ☐ CBD

2. Were any new and modified pollutant-emitting activities (other than fugitive emissions) omitted which should have been included:

☐ No ☐ CBD ☐ Yes, as follows:

Form 4 (continued)

	Emission Unit or Activity/Size	Emissions		New	Modif.	Reason given by agency for not considering as part of source
		Pollutant	TPY			
a.				☐	☐	
b.				☐	☐	
c.				☐	☐	
d.				☐	☐	

3. If Section III.A.2.C. above was marked, did this new source or modification escape PSD or Part D (major source locating in a nonattainment area) review as a result of the omission of the activities?

   ☐ Yes ☐ No ☐ CBD

B. Fugitive Emissions.

1. This source or modification:

   a. ☐ Does not have any quantifiable fugitive emissions. (GO TO Section III.C.)

   b. ☐ Has too little documentation in the file to determine whether quantifiable fugitive emissions occur or were considered.

   c. Has quantifiable fugitive emissions which were:

      i. ☐ Included in determining whether the source/modification was major for the following pollutants: ____________________

      ii. ☐ Not included in determining whether the source was major for the following pollutants: ____________________ because the source is neither one of the 28 PSD source categories nor regulated under Sections 111 or 112 of the Act.

      iii. ☐ Not included in determining whether the source was major for the following pollutants: ____________________, although they should have been.

2. Did this source escape PSD or Part D review as a result of the omission of fugitive emissions?

   ☐ Yes ☐ No ☐ CBD

C. Potential to Emit (PTE). Determination of whether a source is major should be based on PTE rather than actual emissions.

1. The emissions of this source or modification were determined:

   a. Using emission rates based on emission factors which were:

Form 4 (continued)

i. ☐ Well established (e.g., AP-42) or well documented in the file.

ii. ☐ Not well established and lacking adequate documentation for the following units and pollutants: ____________________
____

b. ☐ CBD

c. ☐ Using another method. Explain: ______________________

2. The emissions of this source were determined on the basis of:

a. ☐ CBD, Go to C.3.

b. ☐ Maximum capacity to emit at full physical and operational design; GO TO C.3.

c. ☐ Limited capacity based on control equipment, physical, operational or emission limitations, not otherwise required (e.g., NSPS), as follows:

		If used, was limitation identified on:				
		Preconst. Permit			Operating Permit	
Limitation	Pollutants	Yes	No	Yes	No	NA
i. ☐ Control equipment*	________	☐	☐	☐	☐	☐
ii. ☐ Emission limit*	________	☐	☐	☐	☐	☐
iii. ☐ Operating hours	________	☐	☐	☐	☐	☐
iv. ☐ Operating rate	________	☐	☐	☐	☐	☐
v. ☐ Fuel/ material restriction	________	☐	☐	☐	☐	☐
vi. ☐ ________	________	☐	☐	☐	☐	☐

*Not otherwise required (i.e., main purpose of limitation is to reduce potential emissions).

If Section III.C.2.c. above is marked, please describe the limitations:
____
____
____

Form 4 (continued)

3. Do the calculated emissions correctly represent the source's potential emissions?

   a. [ ] YES

   b. [ ] CBD Explain: ____

   c. No, because:

      i. [ ] calculations based on control equipment, physical, operational or emission limitations that are not Federally enforceable

      ii. [ ] emission factors not acceptable

      iii. [ ] did not adequately address fugitive emissions

      iv. [ ] did not address all pollutant-emitting activities (other than fugitives) Explain: ______________________________

      ____

      v. [ ] other. Explain: ____________________________________

      ____

D. Emission Netting.

1. Check the appropriate box for this permit action:

   a. [ ] New source; emission netting not applicable. GO TO Section III.E.

   b. [ ] Source was not required by agency to determine any net change in emissions, but should have been. EXPLAIN: ____________ ________________________________. GO TO Section III.E.

   c. [ ] Source review included a determination of a net change in emissions.

2. The determination of significant emissions can be a complex process when emission netting occurs. The following worksheet should be used to determine whether the proper procedure was followed:

Pollutant	Proposed emission changes, TPY (+)	Other creditable, contemporaneous emissions changes, TPY (+)	Other creditable, contemporaneous emissions changes, TPY (-)	Overall net change, TPY
a. TSP	___	_____	_____	_____
b. PM_{10}	___	_____	_____	_____

Form 4 (continued)

Pollutant	Proposed emission changes, TPY	Other creditable, contemporaneous emissions changes, TPY		Overall net change, TPY
	(+)	(+)	(-)	
c. SO_2	___	___	___	___
d. NO_x	___	___	___	___
e. O_3(VOC)	___	___	___	___
f. CO	___	___	___	___
g. ______	___	___	___	___
h. ______	___	___	___	___

3. Did agency correctly identify whether emissions were significant?

   ☐ Yes ☐ CBD ☐ No, explain ________________________________

   ____

4. Did analysis consider all pollutants for which a net increase in emissions occurred?

   ☐ Yes.

   ☐ No, failed to address one or more pollutants. Explain: ______

   ____

   ☐ CBD. Explain: ____

   ____

COMPLETE THE FOLLOWING APPLICABLE STATEMENTS.

5.a. Emission netting was based on actual emissions.

☐ CBD; GO TO Question 7. ☐ No; GO TO Question 6. ☐ Yes

b. Indicate whether the calculation of actual emissions properly considered the following criteria:

	Yes	No	CBD
i. Representative of normal unit operation	☐	☐	☐
ii. Based on a two-year average	☐	☐	☐
iii. Expressed in TPY	☐	☐	☐

Form 4 (continued)

6. Emission netting was based on another approach.

   a. ☐ No.

   b. ☐ Yes, and approach was acceptable. Explain: ____________________
   ____

   c. ☐ Yes, but approach was incorrect. Explain: ____________________
   ____

7. Emission decreases were considered.

   a. ☐ No; GO TO E.

   b. ☐ Yes, and the decreases:

Were	Were not	CBD	N/A	
☐	☐	☐		i. Contemporaneous with the proposed modification.
☐	☐	☐		ii. Previously relied on to determine a net emission change.
☐	☐	☐	☐	iii. Previously counted as part of the SIP attainment strategy (Part D source only).
☐	☐	☐	☐	iv. Previously relied on to meet the "reasonable further progress" requirement of Part D (Part D source only).
☐	☐	☐		v. Made Federally enforceable as permit conditions.

E. Definition of Major. This source was NOT subjected to PSD or Part D provisions because:

1. Potential emissions from the new or existing source were less than (check appropriate box):

   a. ☐ 100 tpy for Part D and/or PSD (28 listed PSD source categories) pollutants; or

   b. ☐ 100 tpy for Part D and/or 250 tpy for PSD (non-listed PSD source categories) pollutants.

2. ☐ Emission increases resulting from modification were not significant.

3. ☐ Source eligible for exemption; describe: ____________________

4. Review agency erred and source should have been subject to:

   a. ☐ PSD review; explain: ________________________________.

   b. ☐ Part D review: explain: ________________________________.

5. ☐ CBD

F. Emission limits.

1. Did the agency identify the appropriate allowable emission rates with respect to each emission unit in the construction permit?

   ☐ Yes. ☐ No; Explain: ____________________________________

2. The number of limitations actually appearing in the preconstruction permit(s) is _________.

3. How many of the limitations:

	Number			
	Yes	No	CBD	Total
a. Include clear and concise averaging periods compatible with appropriate requirements (e.g., NSPS, short-term NAAQS)?	___	___	___	___
b. Are consistent with acceptable measurement techniques?	___	___	___	___
c. Consist of design, equipment, work practice, or operational standards?	___	___	___	___
d. Appear Federally enforceable?	___	___	___	___
e. Include stated or referenced compliance test methods?	___	___	___	___

G. Applicability Summary. Is there any reason to believe that this application should have been subject to PSD or Part D provisions?

1. ☐ NO, GO TO Section IV.

2. ☐ YES. Explain: ____________________________________

   ____

Form 4 (continued)

SECTION IV. CONTROL TECHNOLOGY

1. Does the file contain documentation to show that the reviewing agency verified the applicant's calculations and assumptions pertaining to the selected control technology?

   ☐ Yes ☐ No

   Comments: ______________________________

2. Does file documentation show that the reviewing agency ascertained compliance of estimated emissions with applicable SIP limits?

   ☐ Yes ☐ No

   Comments: ______________________________

3. Is the source subject to NSPS or NESHAP requirements?

   ☐ Yes ☐ No, GO TO Section V.

4. Was the source identified by the agency as being subject to:

   a. NSPS: ☐ Yes, for ______________.

      ☐ No, because no NSPS apply.

      ☐ No, but should have been. Explain: ______________________________

   b. NESHAP: ☐ Yes, for: ______________.

      ☐ No, because no NESHAP apply.

      ☐ No, but should have been. Explain: ______________________________

SECTION V. AMBIENT AIR QUALITY ANALYSIS (NAAQS Protection)

1. Was an ambient impact analysis performed?

   ☐ No, Go To Question 8.

Form 4 (continued)

☐ YES, as follows:

	Pollutant	Identify model used in the appropriate blanks below.		
a.	☐ TSP or ☐ PM_{10}		☐ 24hr: ____	☐ annual: ____
b.	☐ SO_2	☐ 3hr: ____	☐ 24hr: ____	☐ annual: ____
c.	☐ NO_x			☐ annual: ____
d.	☐ CO	☐ 1hr: ____	☐ 8hr: ____	
e.	☐ O_3	☐ 1hr: ____		
f.	☐ Pb			☐ 3mos: ____

2. For the pollutants checked above, how was the analysis performed:

	FOR THESE POLLUTANTS:	
☐ a. by the applicant with adequate review (including replication of results, if appropriate) by the agency.	☐ all	☐: ____
☐ b. by the applicant without adequate review by the agency. Explain: ____________	☐ all	☐: ____
☐ c. by the agency.	☐ all	☐: ____

3. Did the applicant/agency use the appropriate model(s) to complete the analysis?

	FOR THESE MODELS:	
☐ a. YES, and documentation supports use of the model(s).	☐ all	☐: ____
☐ b. YES, but inadequate documentation was available to explain its use.	☐ all	☐: ____
☐ c. CBD, documentation not provided to justify model selection.	☐ all	☐: ____
☐ d. NO, documentation failed to address appropriate considerations.	☐ all	☐: ____

Explain: ____________________________________

____

Form 4 (continued)

4. Did the agency exercise the appropriate model options (urban/rural, receptor network design, wind speed profiles, building wake effects, final/gradual plume rise, etc.)?

FOR THESE MODELS:

☐ a. Yes, and doumentation supports use of each option as being appropriate. — ☐ all ☐: ________

☐ b. Yes, each option was appropriate, but inadequate documentation was available to explain its selection. — ☐ all ☐: ________

☐ c. Cannot be determined. Documentation not provided to justify option selection. — ☐ all ☐: ________

☐ d. No, documentation failed to address appropriate considerations. — ☐ all ☐: ________
Explain: ________________________

5. Did the analysis consider appropriate meteorological data?

☐ a. YES, five consecutive years of the most recent representative sequential hourly National Weather Service data.

☐ b. YES, one year of MWS data (if 5 not available) + use of highest modeled results.

☐ c. YES, five years of on site data subjected to quality assurance procedures.

☐ d. YES, at least one year of hourly sequential on site data, including worst-case conditions and subjected to quality assurance procedures.

☐ e. NO; Explain: ____

☐ f. CBD

6. Is there sufficient information in the file to verify that emissions from the following stationary sources (including sources with permits, but not yet in operation) were adequately considered when appropriate?

	YES	NO	NA
a. existing major stationary sources. If no, explain: ________________________	☐	☐	☐
b. existing minor and area stationary sources. If no, explain: ________________________	☐	☐	☐

Form 4 (continued)

7. Did the analysis provide adequate consideration of multi-source pollutant interactions?

   a. ☐ YES, analysis adequately defined points of maximum impact determined from consideration of all sources in the vicinity rather than the maximum impact of the proposed source alone.

   b. ☐ NO, analysis ignored significant emissions from other sources in the vicinity. Explain: ____________________________

   c. ☐ CBD from information available in file.

8. Is there any reason to believe that the proposed project should have been subjected to an ambient impact analysis that was not performed?

   a. ☐ YES, source was within 10 km of a Class I area but its ambient impact was not considered.

   b. ☐ YES; Explain: c. ☐ NO.____________________________

   d. ☐ CBD.

SECTION VI. ADDITIONAL REVIEW

1. Was this source subject to any of the following additional reviews?

	Yes	No	
a.	☐	☐	BACT
b.	☐	☐	LAER
c.	☐	☐	PSD/Increment analysis

Comments:

Work Sheet

Emissions Unit ID ______________ Modified [ ] Unit/Size ______________ One of 28 categories [ ]

Pollutant	Geographic Applicability		Pollutant Applicability								
	Attain.	Nonattain.	Pollution[1] Level Before Change (TPY)	Other Creditable Increases	Creditable Decreases	Net Emission Increase	Fugitives Counted	Major or Signif.	Bases for Determination[2]	BACT/LAER Done?	Emission Limitations/Test Methods
PM_{10}											
TSP											
NO_x											
CO											
VOC											
SO_2											
Pb		N/A									
Asbestos		N/A									
Beryllium		N/A									
Mercury		N/A									
Vinyl chloride		N/A									
Fluorides		N/A									
Sulfur acid mist		N/A									
Hydrogen sulfide		N/A									
Total reduced sulfur		N/A									
Reduced sulfur components		N/A									
Air Toxics											

1. Measured as actual emissions
2. Actual, allowable, PTE

Emission Limitations Summary:		Yes	No	Total
	clear and concise	____	____	____
	acceptable measurement technique	____	____	____
	consistent of design equipment, work practice, or operational standard	____	____	____
	federally enforceable	____	____	____
	include stated or reference compliance test methods	____	____	____

Chapter 4

Compliance Assurance Audit Guidelines

FY 1988-1989

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Chapter 4

Compliance Assurance Audit Guidelines

FY 88-89

A. INTRODUCTION

The major parts of the compliance assurance element in the FY 88-89 audit period will be periodic review and assessment of source data, asbestos demolition and renovation, file reviews, and overview inspections. There will be continued emphasis on volatile organic compound (VOC) sources in states with ozone nonattainment areas.

The questions which follow were developed for use by all ten regions to ensure consistency in the National Air Audit System (NAAS) effort, and provide an accurate basis for national comparison of state compliance programs. All questions must be answered and procedures followed for each audit.

The time period to be covered by the audits is the most recent twelve months preceeding the on-site visit, with the exception of CDS data. For CDS data, the most recent fiscal year should be used (i.e., FY 87 or FY 88) or a state's fiscal year if that is more appropriate.

B. PERIODIC REVIEW AND ASSESSMENT OF SOURCE DATA

To assess the adequacy of state compliance programs in meeting Clean Air Act requirements, the EPA regional offices continually review source compliance status and inspection information submitted by the state for the SIP, NSPS, and NESHAPs programs. This information is contained in the CDS. In preparation for each audit, the regions are to obtain CDS retrievals for operating Class A state implementation plan sources (SIP, including NSR and PSD), new source performance standards sources(NSPS), and nontransitory NESHAP sources. These retrievals should include information on inspection frequency, compliance rates, and enforcement activity for the most recent fiscal year. This data must then be analyzed by answering the following questions to show the status of a state's compliance program.

1) What percentage of sources in the state received the required inspections as specified in the Section 105 grant agreement? Prepare an inspection summary for each state as follows:

Progress in Meeting Inspection Commitments in the State Grant

	Class A1 SIP	NSPS*	NESHAP*
Total percentage of sources committed to for Fiscal Year			
Percentage of Sources actually inspected during Fiscal Year			

*Assumes program delegated to state

2) What is the compliance status breakdown of sources in each air program? Prepare compliance chart for each state as follows:

Compliance Status of Sources

Program	In Compliance	Meeting Schedule	In Violation	Unknown	Total
Class A SIP					
Class A1 SIP					
Class A1 VOC					
NSPS					
NESHAP					

3) Based on CDS, what percentage of Class A1 SIP, NSPS, and NESHAP long-term complying sources (defined as being in compliance two consecutive quarters or more) have recently (within the past year) had state compliance inspections? Specify results for each program separately including the numbers used to derive the percentages.

4) Regarding "Timely and Appropriate" (T&A) response to violators:

- For the current fiscal year, what are the numbers of violators in each category II (A)-(D) of the "timely and appropriate" guidance?
- What procedures have been established for reporting of data by the state? How are violators subject to the guidance reported to the region? Have these procedures been followed by the state? (This should be answered only if procedures have changed from previous years).
- Give specifics of state actions and results in cases where EPA deferred action beyond day 120.
- Has the state always satisfied penalty requirements where applicable under the "Timely and Appropriate" guidance?
- What procedures have been established for NESHAP sources subject to T&A? Are the penalty, data transfer, and consultation requirements being satisfied?
- Overall, has the state followed all of the "Timely and Appropriate" procedures it agreed to?

5) How many long-term violators (shown in CDS as in violation two consecutive quarters or more) have not been subject to enforcement activity or additional surveillance activity? Provide a source by source listing of the state's Class A SIP, NSPS, and NESHAPs long-term violators including type and date of most recent surveillance or enforcement activity.

6) What is the region's overall assessment of the state compliance program?

Following the investigation into each of these questions, findings are to be outlined for each state program under the heading of "Pre-visit Assessment of State Compliance Program". These findings should include a clear and concise statement on what CDS reflects about the program and how T&A is being implemented. Conclusions should then be drawn on the condition of the state's compliance program, and summarized in paragraph form.

The pre-visit assessment should be sent to the state prior to the audit. The region should include in this transmittal questions it wants to follow-up on and any other air compliance related items requiring discussion during the audit - such as findings from the overview inspections.

C. ASBESTOS DEMOLITION AND RENOVATION (D&R)

Because EPA has established compliance with the various NESHAP regulations as a high priority, the Agency in April 1984 issued an Asbestos Strategy Document to Regional Air Division Directors and Regional Counsels. The document's purpose was to aid in the goal of ensuring that sources violating asbestos NESHAP regulations for D&R are identified and corrected and that appropriate enforcement action is taken.

The essential elements of a successful asbestos compliance program are:

- strategy for identification of non-notifiers and violators of applicable NESHAP regulations;
- inspection strategy to ensure that asbestos operations and activities are performed properly;
- prompt initiation of enforcement actions whenever asbestos violations are found;
- assessment of penalties for violations, and prompt collection of those penalties;
- use of proper safety equipment during inspections including appropriate training for inspectors.

The Agency believes many asbestos problems are area specific and best resolved through state and local action. The following questions will help evaluate the effectiveness of a particular state or local program where enforcement authority has been delegated.

1. How does the delegated agency ensure compliance with the demolition and renovation notification requirements? What is the delegated agency's strategy for learning about nonnotifiers i.e., publicity campaigns to promote whistleblowing or private citizen reporting, etc?

2. What procedures are followed when violations are identified? Are violations from notifiers and non-notifiers treated differently?

3. Are penalties routinely assessed and collected according to EPA's Asbestos D&R Penalty Policy (or the state's penalty policy)?

4. Is a contractor certification program for asbestos sampling and analysis in place? Please describe.

5. Is a manifest system to keep track of removal, hauling, and disposal of asbestos material in place?

6. Do you know locations and disposal requirements of approved landfills in each state?

Following the discussion of these six questions, the audit team should conduct a file review devoted entirely to NESHAP Demolition and Renovation (D&R) compliance. The file review should determine compliance with requirements in 40 CFR 61, Subpart M., for applicability, notification and control procedures for asbestos D&R projects.

This file review is separate from the file review in Section D and should include a representative sample of D&R files. The following questions should form the basis of each file reviewed.

1. Is the project demolition or renovation?

2. Is the applicability portion of the regulations adequately addressed?

3. Is the notification portion of the regulations adequately addressed?

4. Is compliance with required control procedures (wetting and removal) adequately addressed?

5. If there is an inspection report, does it contain the following:

   a. Name and location of source, date of inspection,

   b. Applicable regulation,

   c. Sample and analysis information,

d. Proper chain of custody procedures, and

e. Evidence of compliance with applicable safety procedures?

6. From the information in the file, can the reviewer determine the compliance status of the project?

The D&R section of the compliance assurance report should include answers to the six D&R program questions, as well as a summary of all files reviewed for each of the six D&R file review questions.

D. FILE REVIEW

An effective state and local compliance program must have a well documented file on each source. This file should be available for use by management and field personnel. The structure and location of files are optional as long as any needed data can be supplied upon request. The files should contain information supporting the compliance status of each source.

The audit team should review a representative sample of files from the three air programs (SIP, NSPS, non-D&R NESHAP) in each state or local agency. In state with ozone nonattainment areas, the sample should concentrate on VOC sources. In most cases, each state audit file review should consist of 15-20 files. Selection of sources for file review should be based on such factors as duration of violation, NSPS sources with CEM requirements, recently reported compliance changes, citizen or congressional inquiries, problems surfaced in the CDS previsit program analysis, personal knowledge of the source, VOC sources in ozone nonattainment areas, or non-D&R NESHAP sources.

For each file reviewed, the following questions must be answered. The purpose of these seventeen questions is to gather the information necessary to answer the three file review summary questions for the audit report.

1. Can the reviewer, from information available in the file, determine the programs to which the source is subject? If not, why? The various programs are SIP, PSD, NSPS and non-D&R NESHAPs.

---

*For the purposes of this report, the term "source" is synonymous with facility and consists of one or more emission points or processes.

2. From the information available in the file, can the source's compliance status be determined for all regulations to which it is subject?

3. Does the file contain documentation supporting the source's compliance status? (As a minimum, the file should contain: (a) documentation that the source was inspected and that the regulated emission points and pollutants were evaluated, and (b) a determination of the compliance status of the source and documentation of the basis for that determination.)

4. Are all major emission points identified (i.e., in an inspection report, operating permit, etc.,) and each point's compliance status indicated?

5. Does the file identify which emission points are subject to NSR, NSPS, PSD, and non-D&R NEHSAPs requirements? If yes, are regulated continuous emission monitoring (CEM) requirements or permit conditions shown to be in compliance and documented? Are required start-up performance tests included? Are dates for the test specified?

6. Does the file identify special reporting requirements to which a source may be subject (i.e., excess emission reports from malfunction or CEM requirements) and are any such reports found in the file?

7. Does the file include technical reviews, source tests, CEM performance specification tests, permit applications, correspondence to and from the company, and other supporting documentation?

8. What methods of compliance documentation are used (e.g., source test, CEM, fuel sampling and analysis, inspection, certification, engineering analysis, asbestos analysis etc.)?

9. Was the method used to ascertain compliance the most appropriate one for the type of source being documented?· Is the method prescribed by NSPS, NESHAPs or SIP? If not, explain.

10. If the documentation includes an inspection, does the inspection report contain control equipment parameters observed during the inspection (pressure drops, flow rates, voltages, opacities)? Were observed control equipment operating parameters or CEM emission levels compared to permit conditions, design parameters, or baseline observations? Were plant operating parameters recorded?

11. If documentation includes a stack test, were visible emission observations or CEM emissions levels and operating parameters recorded during the test? Were they required? Was there a quality assurance procedure used with a stack test? Who conducted, observed, and reviewed the test?

12. Are enforcement actions contained in the file?

13. Are actions to bring about compliance taken in a timely manner? Do any take longer than 30 days from the time the violation is discovered? If yes, how long?

14. What are the types of documentation in the file to support the enforcement action?

15. What are the types of documentation in the file to show follow-up to the enforcement action (reinspection, letter, etc.)?

16. Regarding citizen compliants: a) are they documented in the file? b) are the investigation and follow-up procedures adequate?

17. What action does the Agency take with respect to reports of excess emissions?

The review team should summarize their findings following the file review by answering the following three questions and including the responses in the NAAS report.

1. Do all files reflect a reasonable profile of the source (meaning that the files contain inspection reports, stack test reports, CEM data, enforcement actions, etc.)? If not, explain.

2. Do all files contain adequate written documentation to support the compliance status reported to EPA? If not, explain.

3. Are violations documented and pursued to return the source to compliance expeditiously? Explain.

E. OVERVIEW INSPECTIONS

To provide quality assurance for compliance data in state or local files furnished to EPA, and to promote effective working relationships between EPA and state or local agencies, EPA should continue the overview inspection program begun in FY 84. It is envisioned that the regions will continue to inspect 2-3% of the Class A SIP, NSPS, and NESHAPs sources in the CDS inventory each fiscal year. The FY 88-89 overview portion of the audit should focus on the overview inspections performed during the most recent fiscal year. As with file reviews, the overview inspections should include a representative portion of VOC sources with special emphasis on those source types most environmentally significant or troublesome based on impact on ozone nonattainment areas, and NESHAP sources including D&R.

EPA should notify the state and local agenices of its intent at least 30 days before each inspection is to take place to encourage their participation (this may not be possible for NESHAP D&R sources but as much advance notification as possible should be given). Each inspection should be an independent verification of the source's compliance status at minimum, and should review the state and local inspector's procedures for determining compliance if the inspection is jointly performed.

To promote uniformity, the following questions must be answered for the overview inspection effort:

1) How were sources selected by the region for the overview inspections?

2) How many inspections were performed?

3) Generally, what did the inspections consist of? Specify inspection procedures used as well as the degree and extent of involvement of state personnel.

4) What was their purpose (that is, to independently verify state reported compliance, to observe state inspection practices, or some combination of these)? Other purposes?

5) Generally, what were the results of the inspections? Answer should relate to purpose stated in item 4.

6) Discuss the important points overall of the overview inspection findings. Give recommendations for resolution of any problems discovered during the effort.

F. COMPLIANCE ASSURANCE REPORT FORMAT

For each audit performed, the region must prepare a compliance assurance report that includes a complete summary of all audit activities and answers to the six asbestos D&R questions and file review questions on pages 4 thru 6, the three file review questions on page eight and the six overview questions on page nine. In addition, the report should include the conclusions reached on the previsit assessment (see page three). The main body of the report should follow the questionnaire exactly in each of the four areas (Pre-Visit Program Assessment, Asbestos D&R, File Review, and Overview Inspections). In addition, each report must include an overall summary of findings for each state program including positive and negative points, and recommendations for resolution. This summary of findings should be at the beginning of the compliance assurance report and/or contained in the report's executive summary. Each report should be reviewed by the audited agency to help eliminate misconceptions or misunderstandings and to ensure factual accuracy before it is finalized.

CHAPTER 5

Air Monitoring Audit Guidelines

FY 1988-1989

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11.3	Preliminary Assessment and Systems Audit Planning	5-9
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11.7	Systems Audit Questionnaire - Long Form	LF-1

SUMMARY OF CHANGES TO THE NATIONAL AIR AUDIT SYSTEM GUIDANCE FOR AIR MONITORING

During the FY 1985 and FY 1986 to 1987 National Air Audit Cycles, the audit guidance utilized for those audits was identical to the guidance for systems audit provided in Section 2.0.11 of the Quality Assurance for Air Pollution Measurement Systems Handbook, Volume II, EPA-600/4-77-027a. This guidance will again be used for the FY 1988 to 1989 National Air Audit Cycle. However, because this material does not include PM_{10}, the short and long form questionnaires of Section 11.6 and 11.7 have been modified to include information concerning PM_{10} monitoring for the FY 1988 to 1989 audit. These are temporary revisions necessary to accomplish the goals of the FY 1988 to 89 National Audit program. The Environmental Monitoring Systems Laboratory (EMSL) will revise Section 2.0.11 of the handbook, according to established procedures for handbook revision, at a future date which has yet to be determined.

It is assumed that, as in the past biennial audit cycle, approximately 50 percent of the agencies will be audited each year of the FY 1988 to 1989 cycle.

The Air Quality Management Division of the Office of Air Quality Planning and Standards will develop a schedule for submission of the regionally prepared audit reports.

5. AIR MONITORING

This material is similar to:

SECTION 2.0.11
SYSTEM AUDITS CRITERIA
AND PROCEDURES FOR
AMBIENT AIR MONITORING PROGRAMS

of the

QUALITY ASSURANCE HANDBOOK FOR
AIR POLLUTION MEASUREMENT SYSTEMS,
VOLUME II. EPA-600/4-77-027a

11.0 SYSTEMS AUDIT CRITERIA AND PROCEDURES FOR AMBIENT AIR MONITORING PROGRAMS

11.1 Introduction

11.1.1 General - A systems audit is an on-site review and inspection of a state or local agency's ambient air monitoring program to assess its compliance with established regulations governing the collection, analysis, validation, and reporting of ambient air quality data. A systems audit of each state or autonomous agency within an EPA Region is performed biennially by a member of the Regional Quality Assurance (QA) staff.

The purpose of the guidance included here is to provide the regulatory background and appropriate technical criteria which form the basis for the air program evaluation by the Regional Audit Team. To promote national uniformity in the evaluation of state and local agency monitoring programs and agencies' performance, all EPA Regional Offices are required to use at least the short form questionnaire (Section 11.6), corrective action implementation request (CAIR) (Section 11.4.2), and the systems audit reporting format (Section 11.4.4) each year. Use of sections of the long form questionnaire is left to the discretion of the Regional QA Coordinator, with the concurrence of the State or local agency. The short form questionnaire is essentially the same as the monitoring audit questionnaire used in FY-84. No substantive changes have been made; however, the questionnaire has been reorganized to improve the information received and facilitate its completion. In addition, requests for resubmission of data already possessed by EPA have been deleted.

The scope of a systems audit is of major concern to both EPA Regions and the agency to be evaluated. A systems audit as defined in the context of this document is seen to include an appraisal of the following program areas: network management, field operations, laboratory operations, data management, quality assurance and reporting. The guidance provided concerning topics for discussion during an on-site interview have been organized around these key program areas (Section 11.5). The depth of coverage within these areas may be increased or decreased by using one or more sections of the long-form questionnaire (Section 11.7) in conjunction with the short-form questionnaire (Section 11.6). Besides the on-site interviews, the evaluation should include the review of some representative ambient air monitoring sites and the monitoring data processing procedure from field acquisition through reporting into the Aerometric Information Retrieval System (AIRS) computer system.

The systems audit results should present a clear, complete and accurate picture of the agency's acquisition of ambient air monitoring data.

11.1.2 Road Map to Using this Section - This section contains guidance sufficient information for operating a systems audit of an agency responsible for operating ambient air monitoring sites, as part of the State and Local Air Monitoring Stations (SLAMS) network, and to report the results in a uniform manner. The following topics are covered in the subsections below:

- o A brief sketch of the regulatory requirements which dictate that systems audits be performed, indicating the regulatory uses to which the audit results may be put (Section 11.2);
- o A discussion of
    1) the requirements on the agency operating the SLAMS network;
    2) program facets to be evaluated by the audit; and
    3) additional criteria to assist in determining the required extent of the forthcoming audit; (Section 11.3)
- o A recommended audit protocol for use by the Regional Audit Team, followed by a detailed discussion of audit results reporting (Section 11.4);
- o Criteria for the evaluation of State and local agency performance including suggested topics for discussion during the on-site interviews (Section 11.5);
- o A short-form questionnaire, based on the National Air Monitoring Audit Questionnaire prepared by the STAPPA/ALAPCO Ad Hoc Air Monitoring Audit Committee. (10-20-83) (Section 11.6);
- o A long-form questionnaire, organized around the six key program areas to be evaluted (Section 11.7); and
- o A Bibliography of APA guideline documents, which provides additional technical background for the different program areas under audit (Section 11.8).

The guidance provided in this section is addressed primarily to EPA Regional

QA Coordinators and members of the Regional audit teams to guide them in developing and implementing an effective and nationally uniform yearly audit program. However, the criteria presented can also prove useful to agencies under audit to provide them with descriptions of the program areas to be evaluated.

Clarification of certain sections, special agency circumstances, and regulation or guideline changes may require additional discussion or information. For these reasons, a list of contact names and telephone numbers is given in Table 11-1.

11.2 Regulatory Authority to Perform a Systems Audit

11.2.1 General Regulatory Authority - The authority to perform systems audits is derived from the Code of Federal Regulation (Title 40). Specifically: 40 CFR Part 35, which discusses agency grants and grant conditions, and 40 CFR Part 58, which deals specifically with the installation, operation and quality assurance of the SLAMS/NAMS networks.

The regulations contained in 40 CFR Part 35 mandate the performance of yearly audits of agency air monitoring programs by the Regional Administrators or their designees. Pertinent regulatory citations are summarized in Table 11-2. All citations are quoted directly from the regulations and are intended as an indication of the context within which systems audits are performed and the impact that audit results may have on a given agency. Even though this is the regulatory authority to conduct such audits, for the SLAMS network, the specific authority is derived from 40 CFR Part 58. Three specific citations from 40 CFR Part 58 are also quoted in Table 11-2.

In addition to the regulations presented in Table 11-2, a further requirement is imposed on reporting organizations submitting data summary reports to the National Aerometric Data Bank (NADB) through the AIRS computer system. AIRS acceptance criteria call for at least 75 % data completeness, which has been accepted as a data quality objective for state and local agencies' monitoring operations. The Regional QA Coordinator may wish to use this requirement together with information obtained by accessing the AIRS AMP Computer Programs, discussed in section 11.3. The percent data completeness may be effectively used as an indicator of whether a rigorous

TABLE 11-1. LIST OF KEY CONTACTS AND TELEPHONE NUMBERS

Assistance Area Office/Laboratory	Name	Telephone Number	EPA Location
Laboratory Areas and NPAP	William J. Mitchell	(919) 541-2769 FTS 629-2769	EMSL/QAD/PEB
General QA Guidance	William F. Barnard	(919) 541-2205 FTS 629-2205	EMSL/QAD/PEB
Monitoring Objectives/Siting	Stanley Sleva	(919) 541-5651	OAQPS/MDAD/MRB
PARS System	Gardner Evans	(919) 541-3887	EMSL/MAD/DRB
SAROAD System/NADP	Jake Summers	(919) 541-5694	OAQPS/MDAD/NADB

NPAP = National Performance Audit Program

PARS = Precision and Accuracy Reporting System

NADB = National Aerometric Data Bank

TABLE 11-2. SUMMARY OF REGULATORY AUTHORITY TO CONDUCT SYSTEM AUDITS

A. Highlights of 40 CFR 35

Section Number and Description	Text
35.510-2 Grant Amount	"In determining the amount of support for a control agency, the Regional Administrator will consider A. The functions duties and obligation assigned to the agency by an applicable implementation plan, B. the feasibility of the program in view of the resources to be made available to achieve or maintain EPA priorities and goals C. the probable or estimated total cost of the program in relation to its expected accomplishments D. the extent of the actual or potential pollution problem E. the population served within the agency's jurisdiction F. the financial need, and, H. the evaluation of the agency's performance."
35.510-3 Reduction in Grant Amount	"If the Regional Administrator's annual performance evaluation reveals that the grantee will fail or has failed to achieve the expected outputs described in his approved program, the grant amount shall be reduced....."
35.520 Criteria for (Grant) Award	"No grant may be awarded to any interstate or intermunicipal air pollution control agency unless the applicant provides assurance satisfactory to the Regional Administrator that the agency provides for adequate representation of appropriate State, interstate, local and (when appropriate) international interests in the air quality control region, and further that the agency has the capability of developing and implementing a comprehensive air quality plan for the air quality control region."

TABLE 11-2. SUMMARY OF REGULATORY AUTHORITY TO CONDUCT SYSTEM AUDITS

A. Highlights of 40 CFR 35 (Cont'd)

Section Number and Description	Text
35.520 Criteria for (Grant) Award	No grant may be awarded unless the Regional Administrator has determined that (1) the agency has the capability or will develop the capability, to achieve the objectives and outputs described in its EPA-approved program, and (2) the agency has considered and incorporated as appropriate the recommendations of the latest EPA performance evaluation in its program."
35.530 Grant Conditions	In addition to any other requirements herein, each air pollution control grant shall be subject to the following conditions: A. Direct cost expenditures for the purchase of..... B. The sum of non-Federal recurrent expenditures.... C. The grantee shall provide such information as the Regional Administrator may from time to time require to carry out his functions. Such information may contain, but is not limited to: Air quality data, emission inventory data, data describing progress toward compliance with regulations by specific sources, data on variances granted, quality assurance information related to data collection and analysis and similar regulatory motions, source reduction plans and procedures, real time air quality and control activities, other data related to air pollution emergency episodes, and similar regulatory actions.
35.538-1 Agency Evaluation	"Agency evaluation....should be continuous throughout the budget period. It is EPA policy to limit EPA evaluation to that which is necessary for responsible management of regional and national efforts to control air pollution. The Regional Administrator shall conduct an agency performance evaluation annually in accordance with 35.410."

TABLE 11-2. SUMMARY OF REGULATORY AUTHORITY TO CONDUCT SYSTEM AUDITS

A. Highlights of 40 CFR 35 (Cont'd)

Section Number and Description	Text
35.410 Evaluation of Agency Performance	"A performance evaluation shall be conducted at least annually by the Regional Administrator and the grantee to provide a basis for measuring progress toward achievement of the approved objectives and outputs described in the work program. The evaluation shall be consistent with the requirements of 35.538 for air pollution control agencies...."

TABLE 11-2. SUMMARY OF REGULATORY AUTHORITY TO CONDUCT SYSTEM AUDITS

B. Highlights of 40 CFR 58

Section Number and Description	Text
58.20 Air Quality Surveillance Plan Content (SLAMS)	"By January 1, 1980 the State shall adopt and submit to the Administrator a revision to the plan which will: A. Provide for the..... B. Provide for meeting the requirements of Appendices A, C, D, and E, to this part C. Provide for the operation of..... D. Provide for the review of the air quality surveillance system on an annual basis to determine if the system meets the monitoring objectives defined in Appendix D to this part. Such review must....."
58.23 Monitoring Network Completion	"By January 1, 1983: A. Each station in the SLAMS network must be in operation, be sited in accordance with the criteria in Appendix E to this part, and be located a described on the station's SAROAD site identification form, and B. The quality assurance requirements of appendix A to this part must be fully implemented."
58.34 NAMS Network Completion	"By January 1, 1981: A. Each NAMS must be in operation..... B. The quality assurance requirements of Appendix A to this part must be fully implemented for all NAMS."
Appendix A Section 2.4 National Performance and Systems Audit	"Agencies operating all or a portion of a SLAMS network are required to participate in EPA's national performance audit program and to permit an annual EPA systems audit of their ambient air monitoring program....for additional information about these programs. Agencies should contact either the appropriate EPA Regional Quality Control Coordinator or the Quality Assurance Branch, EMSL/RTP,....for instructions for participation."

rigorous systems audit, using the long form questionnaire, might be needed or not.

11.2.2 Specific Regulatory Guidance - The specific regulatory requirements of an EPA-acceptable quality assurance program are to be found in Appendix A to 40 CFR Part 58. Section 2.2 of Appendix A details the operations for which an agency must have written procedures. The exact format and organization of such procedures is not indicated, however. Thus, many approaches to appropriate documentation have been suggested by EPA, local agencies and other groups.

One approach adopted by many EPA Regional Offices is the organization of the required material into the framework recommended by the EPA Quality Assurance Management Staff in the document titled "Interim Guidelines for the Preparation of Quality Assurance Project Plans" (QAMS 005/80, December 1980). The sixteen (16) elements described in the guideline document provide the framework for organizing the required Air Program operational procedures, integrating quality assurance activities and documenting overall program operations. This approach is consistent with the required fourteen items of 40 CFR Part 58, Appendix A. Table 11-3 illustrates this consistency and demonstrates how each required program element will be evaluated in the context of the program areas used in the organization of the long-form questionnaire.

11.3 Preliminary Assessment and Systems Audit Planning

In performing a systems audit of a given agency, the Regional QA Coordinator is seeking a complete and accurate picture of that agency's current ambient air monitoring operations. Past experience has shown that four (4) person-days should be allowed for an agency operating 10-20 sites within close geographical proximity. The exact number of people and the time alloted to conduct the audit are dependent on the magnitude and complexity of the agency and on the EPA Regional Office resources. During the alloted time frame, the Regional QA Audit Team should perform those inspections and interviews recommended in Section 11.4. This includes on-site interviews with key program personnel, evaluations of some ambient air monitoring sites operated by the agency, and scrutiny of data processing procedures.

TABLE 11-3. SPECIFIC REGULATORY REQUIREMENTS TO BE EVALUATED IN A SYSTEMS AUDIT

REQUIREMENT (40 CFR 58, Appendix A)	PERTINENT SECTION OF QAMS DOCUMENT 005/80	PERTINENT SECTION OF QUESTIONNAIRE (11.7)
(1) Selection of Methods and Analyzers	Project Description Organization & Responsibility	Planning Planning Planning
	QA Objectives	Planning
(1) Selection of Methods, Analyzers	Sampling Procedures	Field Operations
(11) Documentation of Quality Control Information	Sample Custody	Field/Lab Operations
(2) Installation of Equipment (3) Calibration (7) Calibration and Zero/Span Checks for Multiple Range Analyzers	Calibration Procedures and Frequency	Field/Lab Operations
Only applicable if other than automated analyzers are used and analyses are being performed on filters - e.g., NO- or lead and TSP	Analytical Procedures	Lab Operations
(10) Recording and Validating Data	Data Reduction, Validation and Reporting	Data Management

TABLE 11-3. SPECIFIC REGULATORY REQUIREMENTS TO BE EVALUATED IN A SYSTEMS AUDIT (cont'd)

REQUIREMENT (40 CFR 58, Appendix A)	PERTINENT SECTION OF OAMS DOCUMENT 005/80	PERTINENT SECTION OF QUESTIONNAIRE (11.7)
(4) Zero/span checks and adjustments of automated analyzers (5) Control Checks and their frequency (6) Control Limits for Zero/Span	Internal Quality Control Checks	Field/Lab Operations
(7) Calibration and Zero/Span for Multiple Range Analyzers (9) Quality control checks for air pollution episode monitoring		QA/QC
Appendix A - Sections 2.0, 3.0 and 4.0	Performance and Systems Audits	QA/QC
(8) Preventive and Remedial Maintenance	Preventive Maintenance	Field/Lab Operations
Appendix A - Section 4.0	Specific Routine Procedures used to Assess Data Precision, Accuracy and Completeness	QA/QC
(10) Recording and Validating Data		Data Management
(4) Zero/Span checks and adjectments of automated analyzers (6) Control Limits and Corrective Actions	Corrective Action	Field/Lab Operations
(11) Documentation of Quality Control Information (10) Data Recording and Validation	Quality Assurance Reports to Management	Reporting

11.3.1 Frequency of Audits - The EPA Regional Office retains the regulatory responsibility to evaluate agency performance annually. Regional Offices are urged to use the short-form questionnaire (Section 11.6), the CAIR (Fig. 11-4), and the audit reporting format (Section 11.4.4.). Utilizing the above to provide OAQPS with this audit information will establish a uniform basis for audit reporting throughout the country. For many well-established agencies, an extensive systems audit and rigorous inspection may not be necessary every year. The determination of the extent of the systems audit and its rigor is left completely to EPA Regional Office discretion. Therefore, the option is provided here that extensive inspections and evaluations may be accomplished using the short-form questionnaire (Section 11.6), and appropriate section(s) of the long-form questionnaire (Section 11.7). It is suggested that a complete systems audit using the long-form questionnaire be performed at least once every three years. Yearly reports must still, however, include the short form, CAIR, and the report completed according to Section 11.4.4

The primary screening tools to aid the EPA Regional QA Audit Team in determining which type of audit to conduct and its required extent are:

A. National Performance Audit Program (NPAP) Data--which provide detailed information on the ability of participants to certify transfer standards and/or calibrate monitoring instrumentation. Audit Data summaries provide a relative performance ranking for each participating agency when compared to the other participants for a particular pollutant. These data could be used as a preliminary assessment of laboratory operations at the different local agencies.

B. Precision and Accuracy Reporting System (PARS) Data--which provide detailed information on precision and accuracy checks for each local agency and each pollutant, on a quarterly basis. These data summaries could be used to identify out-of-control conditions at different local agencies, for certain pollutants.

C. National Aerometric Data Bank (NADB) AMP430 Data Summaries--which provide a numerical count of monitors meeting and those not meeting specifications on monitoring data completeness on a quarterly basis, together with an associated summary of precision and accuracy probability limits. An additional program, AMP430, will provide data summaries indicating the percent of data by site and or by state for each pollutant.

11.3.2 Selection of Monitoring Sites for Evaluation - It is suggested that approximately five percent (5%) of the sites of each local agency included in the reporting organization be inspected during a systems audit. Many reporting organizations contain a large number of monitoring agencies, while in other cases, a monitoring agency is its own reporting organization. For smaller local agencies, no fewer than two (2) sites should be inspected. To insure that the selected sites represent a fair cross-section of agency operations, one half of the sites to be evaluated should be selected by the agency itself, while the other half should be selected by the Regional QA Audit Team.

The audit team should use both the Precision and Accuracy Reporting System (PARS) and the AIRS computer databases in deciding on specific sites to be evaluated. High flexibility exists in the outputs obtainable from the NADB AMP430 computer program; data completeness can be assessed by pollutant, site, agency, time period and season. These data summaries would assist the Regional audit team in spotting potentially persistent operational problems in need of more complete on-site evaluation. At least one site showing poor data completeness, as defined by AIRS, must be included in those selected to be evaluated.

If the reporting organization under audit operates many sites and/or its structure is complicated and perhaps inhomogeneous, then an additional number of sites above the initial 5% level should be inspected so that a fair and accurate picture of the state and local agency's ability to conduct field monitoring activities can be obtained. At the completion of the site evaluations, the Regional audit team is expected to have established the adequacy of the operating procedures, the flow of data from the sites and to be able to provide support to conclusions about the homogeneity of the reporting organization.

11.3.3 Data Audits - With the implementation by many agencies of automated data acquisition systems, the data management function has, for the most part, become increasingly complex. Therefore, a complete systems audit must include a review of the data processing and reporting procedures starting at the acquisition stage and terminating at the point of data entry into the SAROAD computer system. The process of auditing the data processing trail will be dependent on size and organizational characteristics of the reporting organization, the volume of data processed, and the data acquisition system's characteristics. The details of performing a data processing audit are left, therefore, to Regional and reporting organization personnel working together to establish a data processing audit trail appropriate for a given agency.

Besides establishing and documenting processing trails, data processing audits procedure must involve a certain amount of manual recomputation of raw data. The preliminary guidance provided here, for the number of data to be manually recalculated, should be considered a minimum enabling only the detection of gross data mishandling:

(a) For continuous monitoring of criteria pollutants, the Regional QA Coordinator should choose two 24-hour periods from the high and low seasons for that particular pollutant per local agency per year. (In most cases the seasons of choice will be winter and summer). The pollutant and time interval choices are left to the Regional auditor's discretion.

(b) For manual monitoring, four 24-hour periods per local agency per year should be recomputed.

The Regional QA Coordinator should choose the periods for the data processing audit while planning the systems audit and inspecting the completeness records provided by the NADB AMP430 system. The recommended acceptance limits for the differences between the data input into SAROAD and that recalculated during the on-site phase of the systems audit, are given in Table 11-4.

TABLE 11-4. ACCEPTANCE CRITERIA FOR DATA AUDITS

Data Acquisition Mode	Pollutants	Measurement Range (ppm)(a)	Tolerance Limits
Automatic Data Retrieval	SO2, O3, NO2	0-0.5, or 0-1.0	±3 ppb
	CO	0-20, or 0-50	±0.3 ppm
Stripchart Records	SO2, O3, NO2	0-0.5, or 0-1.0	±20 ppb
	CO	0-20, or 0-50	±1 ppm
Manual Reduction	TSP	-----	±2 g/m3 (b)
	Pb	-----	±0.1 g/m3

(a) Appropriate scaling should be used for higher measurement ranges.
(b) Specified at 760 mm Hg and 25oC.

Systems audits conducted on large reporting organizations (e.g. four local agencies) require recomputation of eight 24-hour periods for each of the criteria pollutants monitored continuously. This results from two 24-hour periods being recomputed for each local agency, for each pollutant monitored, during a given year. For manual methods, sixteen 24-hour periods are recomputed, consisting of four periods per local agency, per year.

11.4 Guidelines for Conducting Systems Audits of State and Local Agencies

A systems audit should consist of three separate phases:

- o Pre-Audit Activities
- o On-Site Audit Activities
- o Post-Audit Activities

Summary activity flow diagrams have been included as Figures 11-1, 11-2 and 11-3, respectively. The reader may find it useful to refer to these diagrams while reading this protocol.

11.4.1 Pre-Audit Activities - At the beginning of each fiscal year, the Regional QA Coordinator or a designated member of the Regional QA Audit Team, should establish a tentative schedule for on-site systems audits of the agencies within their region.

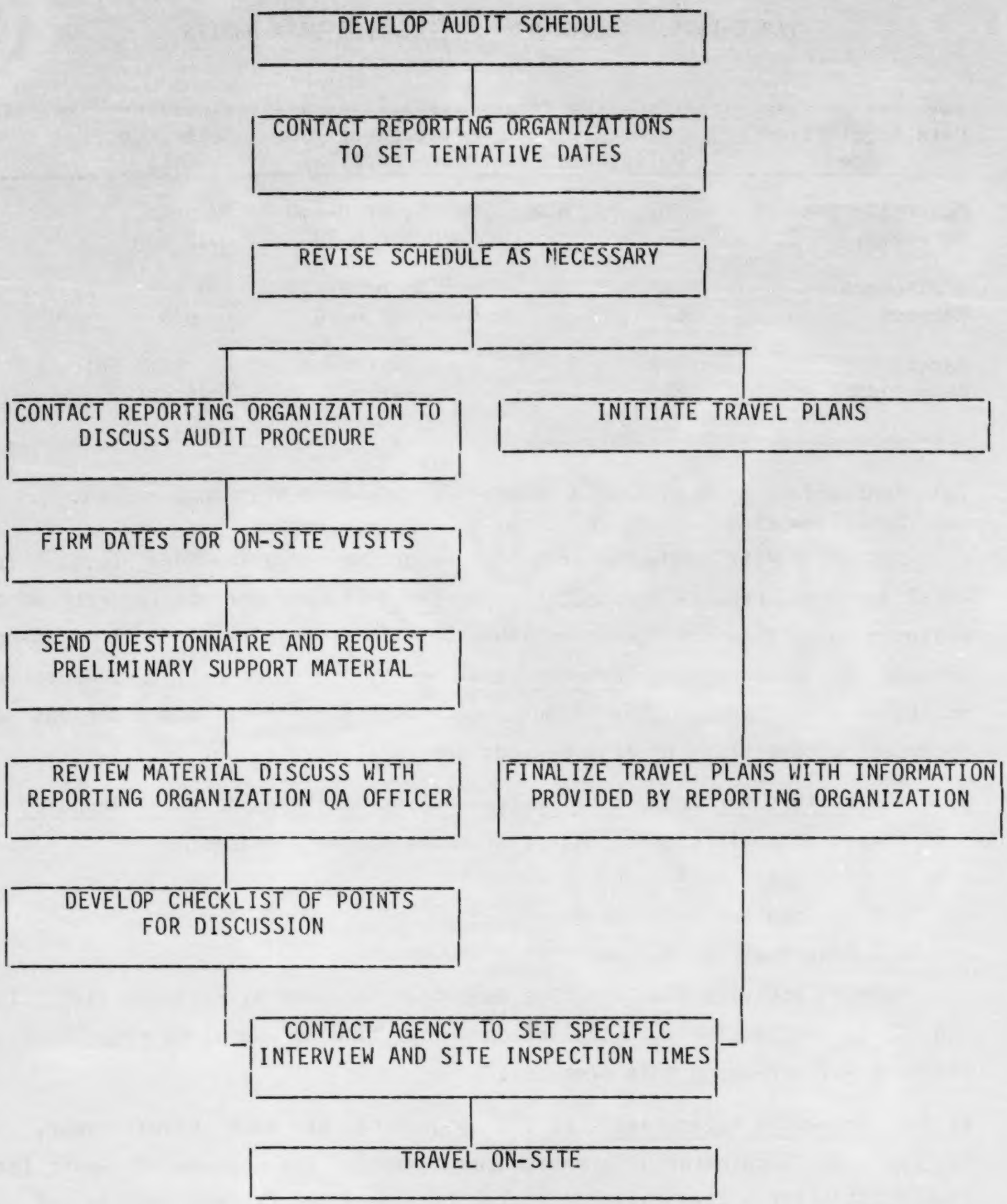
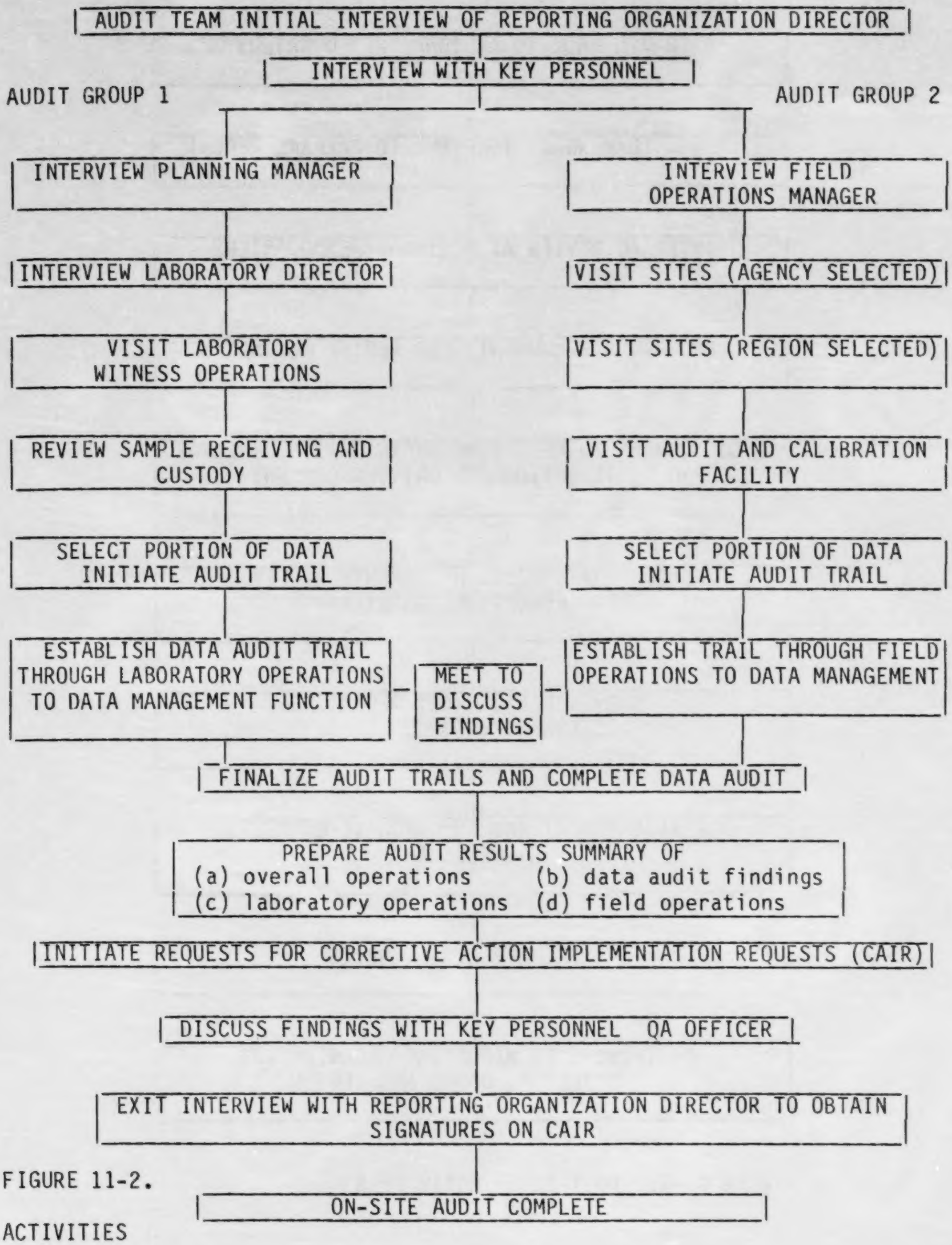

DEVELOP AUDIT SCHEDULE
CONTACT REPORTING ORGANIZATIONS TO SET TENTATIVE DATES
REVISE SCHEDULE AS NECESSARY
CONTACT REPORTING ORGANIZATION TO DISCUSS AUDIT PROCEDURE
INITIATE TRAVEL PLANS
FIRM DATES FOR ON-SITE VISITS
SEND QUESTIONNAIRE AND REQUEST PRELIMINARY SUPPORT MATERIAL
REVIEW MATERIAL DISCUSS WITH REPORTING ORGANIZATION QA OFFICER
FINALIZE TRAVEL PLANS WITH INFORMATION PROVIDED BY REPORTING ORGANIZATION
DEVELOP CHECKLIST OF POINTS FOR DISCUSSION
CONTACT AGENCY TO SET SPECIFIC INTERVIEW AND SITE INSPECTION TIMES
TRAVEL ON-SITE

Figure 11-1. PRE-AUDIT ACTIVITIES



AUDIT TEAM INITIAL INTERVIEW OF REPORTING ORGANIZATION DIRECTOR

INTERVIEW WITH KEY PERSONNEL

AUDIT GROUP 1

INTERVIEW PLANNING MANAGER

INTERVIEW LABORATORY DIRECTOR

VISIT LABORATORY WITNESS OPERATIONS

REVIEW SAMPLE RECEIVING AND CUSTODY

SELECT PORTION OF DATA INITIATE AUDIT TRAIL

ESTABLISH DATA AUDIT TRAIL THROUGH LABORATORY OPERATIONS TO DATA MANAGEMENT FUNCTION

AUDIT GROUP 2

INTERVIEW FIELD OPERATIONS MANAGER

VISIT SITES (AGENCY SELECTED)

VISIT SITES (REGION SELECTED)

VISIT AUDIT AND CALIBRATION FACILITY

SELECT PORTION OF DATA INITIATE AUDIT TRAIL

ESTABLISH TRAIL THROUGH FIELD OPERATIONS TO DATA MANAGEMENT

MEET TO DISCUSS FINDINGS

FINALIZE AUDIT TRAILS AND COMPLETE DATA AUDIT

PREPARE AUDIT RESULTS SUMMARY OF
(a) overall operations (b) data audit findings
(c) laboratory operations (d) field operations

INITIATE REQUESTS FOR CORRECTIVE ACTION IMPLEMENTATION REQUESTS (CAIR)

DISCUSS FINDINGS WITH KEY PERSONNEL QA OFFICER

EXIT INTERVIEW WITH REPORTING ORGANIZATION DIRECTOR TO OBTAIN SIGNATURES ON CAIR

ON-SITE AUDIT COMPLETE

FIGURE 11-2.

ACTIVITIES

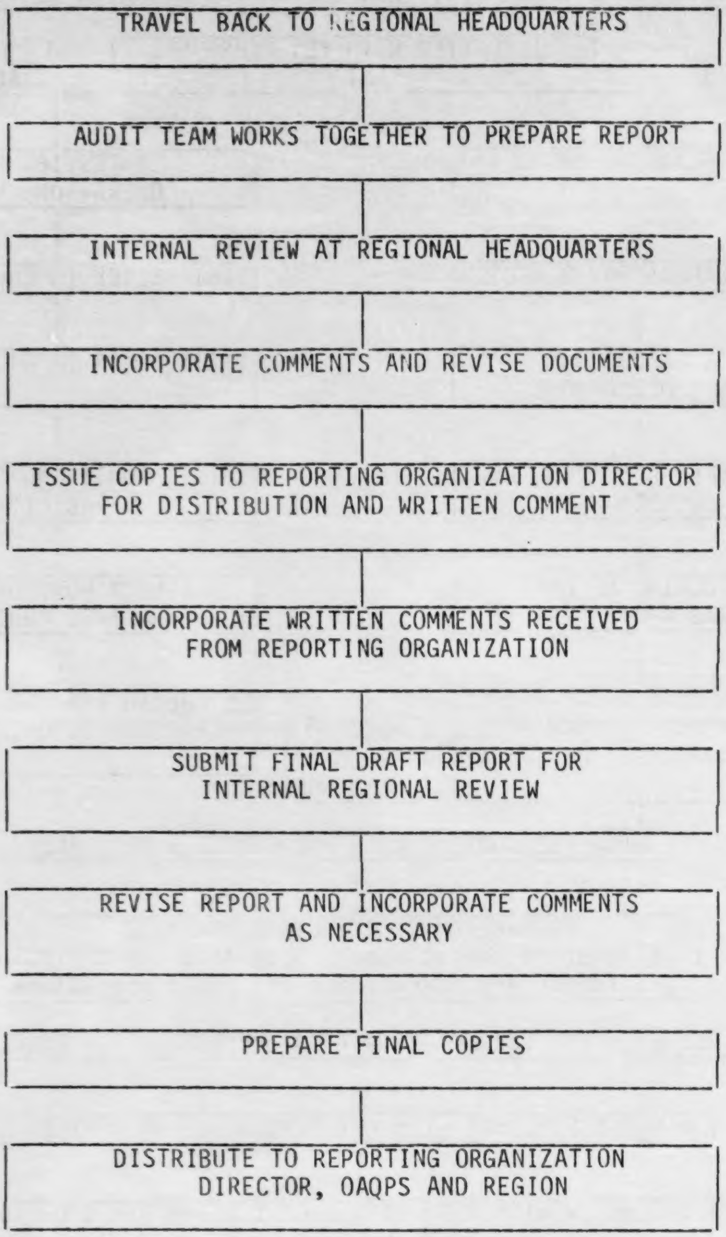

TRAVEL BACK TO REGIONAL HEADQUARTERS
AUDIT TEAM WORKS TOGETHER TO PREPARE REPORT
INTERNAL REVIEW AT REGIONAL HEADQUARTERS
INCORPORATE COMMENTS AND REVISE DOCUMENTS
ISSUE COPIES TO REPORTING ORGANIZATION DIRECTOR FOR DISTRIBUTION AND WRITTEN COMMENT
INCORPORATE WRITTEN COMMENTS RECEIVED FROM REPORTING ORGANIZATION
SUBMIT FINAL DRAFT REPORT FOR INTERNAL REGIONAL REVIEW
REVISE REPORT AND INCORPORATE COMMENTS AS NECESSARY
PREPARE FINAL COPIES
DISTRIBUTE TO REPORTING ORGANIZATION DIRECTOR, OAQPS AND REGION

Figure 11-3. POST-AUDIT ACTIVITIES

Six (6) weeks prior to the audit, the Regional QA Coordinator should contact the Quality Assurance Officer (QAO) of the reporting organization to be audited to coordinate specific dates and schedules for the on-site audit visit. During this initial contact, the Regional QA Coordinator should arrange a tentative schedule for meetings with key personnel as well as for inspection of selected ambient air quality monitoring and measurement operations. At the same time, a schedule should be set for the exit interview used to debrief the agency Director or his designee, on the systems audit outcome. As a part of this scheduling, the Regional QA Coordinator should indicate any special requirements such as access to specific areas or activities. The Regional QA Coordinator should inform the agency QAO that he will receive a questionnaire, precision and accuracy data, and completeness data from NADB programs AMP240 and AMP430 which is to be reviewed or completed. He should emphasize that the completed questionnaire is to be returned to the EPA Region within one (1) month of receipt. The additional information called for within the questionnaire is considered as a minimum, and both the Region and the agency under audit should feel free to include additional information.

The Regional Audit Team may use this initial contact or subsequent conversations to obtain appropriate travel information, pertinent data on monitoring sites to be visited, and assistance in coordinating meeting times.

Once the completed questionnaire has been received, it should be reviewed and compared with the criteria and information discussed in Section 11.2 and with those documents and regulations included by reference in Section 11.5. The Regional QA Audit Team should also use the PARS and NADB AMP240 and AMP430 to augment the documentation received from the reporting organization under audit. This preliminary evaluation will be instrumental in selecting the sites to be evaluated and in the decision on the extent of the monitoring site data audit. The Regional Audit Team should then prepare a checklist detailing specific points for discussion with agency personnel.

The Region Audit Team could be made of several members to offer a wide variety of backgrounds and expertise. This team may then divide into groups once on-site, so that both audit coverage and time utilization can be optimized. A possible division may be that one group assess the support laboratory and headquarters operations while another evaluates sites and subsequently assesses audit and calibration information. The team leader should reconfirm the proposed audit schedule with the reporting organization immediately prior to travelling to the site.

11.4.2 On-Site Activities - The Regional QA Audit Team should meet initially with the agency's Director or his designee to discuss the scope, duration, and activities involved with the audit. This should be followed by a meeting with key personnel identified from the completed questionnaire, or indicated by the agency QAO. Key personnel to be interviewed during the audit are those individuals with responsibilities for: planning, field operations, laboratory operations, QA/QC, data management, and reporting. At the conclusion of these introductory meetings, the Regional Audit Team may begin work as two or more independent groups. A suggested auditing method is outlined in Figure 11.2.

To increase uniformity of site inspections, it is suggested that a site checklist be developed and used.

The importance of the data processing systems audit cannot be overstated. Thus, sufficient time and effort should be devoted to this activity so that the audit team has a clear understanding and complete documentation of data flow. Its importance stems from the need to have documentation on the quality of ambient air monitoring data for all the criteria pollutants for which the agency has monitoring requirements. The data processing systems audit will serve as an effective framework for organizing the extensive amount of information gathered during the audit of laboratory, field monitoring, and support functions within the agency.

The entire audit team should prepare a brief written summary of findings organized into the following areas: planning, field operations, laboratory operations, quality assurance/quality control, data management, and reporting. Problems with specific areas should be discussed and an attempt made to rank them in order of their potential impact on data quality. For the more serious of these problems, Corrective Action Implementation Request (CAIR) forms should be initiated. An example form is provided in Figure 11-4. The forms have been designed such that one is filled out for each major deficiency noted that requires formal corrective action.

CORRECTIVE ACTION IMPLEMENTATION REQUEST (CAIR)

Reporting Organization ______________________________

State or Local Agency ______________________________

==

Deficiency Noted:

Agreed-upon Corrective Action:

Schedule for Corrective Action Implementation:

Signed ____________________ Director ____________________ Date

____________________ QA Officer ____________________ Date

____________________ Audit Team Member __________ Date

==

Corrective Action Implementation Report:

____

Signed ____________________ Director ____________________ Date

Signed ____________________ QA Officer ____________________ Date

The format, content, and intended use of CAIRs is fully discussed in Section 11.4.5 of this document. Briefly, they are request forms for specific corrective actions. They are initiated by the Regional QA Audit Team and signed upon mutual agreement by the agency's Director or his designee during the exit interview.

The audit is now completed by having the Regional Audit Team members meet once again with key personnel, the QAO and finally with the agency's Director or his designee to present their findings. This is also the opportunity for the agency to present their disagreements. The audit team should simply state the audit results including an indication of the potential data quality impact. During these meetings the audit team should also discuss the systems audit reporting schedule and notify agency personnel that they will be given a chance to comment in writing, within a certain time period, on the prepared audit report in advance of any formal distribution.

11.4.3 Post-Audit Activities - The major post-audit activity is the preparation of the Systems Audit Report. The report format is presented in Section 11.4.4.

To prepare the report, the audit team should meet and compare observations with collected documents and results of interviews and discussions with key personnel. Expected QA Project Plan implementation is compared with observed accomplishments and deficiencies and the audit findings are reviewed in detail. Within thirty (30) calendar days of the completion of the field work, the audit report should be prepared and submitted.

The Systems Audit Report is submitted to the audited agency together with a letter thanking agency personnel for their assistance, time and cooperation. It is suggested that the body of the letter be used to reiterate the fact that the audit report is being provided for review and written comment. The letter should also indicate that, should no written comments be received by the Regional QA Coordinator within thirty (30) calendar days from the report date, it will be assumed acceptable to the agency in its current form, and will be formally distributed without further changes.

If the agency has written comments or questions concerning the audit report, the Regional Audit Team should review and incorporate them as appropriate, and subsequently prepare and resubmit a report in final form within thirty (30) days of receipt of the written comment. Copies of this report should be sent to the agency Director or his designee for his internal distribution. The transmittal letter for the ammended report should indicate official distribution and again draw attention to the agreed-upon schedule for Corrective Action Implementation.

11.4.4 Audit Reporting - The Systems Audit Report format discussed in this section has been prepared to be consistent with guidance offered by the STAPPA/ALAPCO Ad Hoc Air Monitoring Audit Committee. The format is considered as acceptable for annual systems audit reports submitted to the OAQPS. Regional Audit Team members shall use this framework as a starting point and include additional material, comments, and information provided by the agency during the audit to present an accurate and complete picture of its operations and performance evaluation.

At a minimum, the systems audit report should include the following six sections:

Executive Summary -- summarizes the overall performance of the agency's monitoring program. It should highlight problem areas needing additional attention and should describe any significant conclusions and/or broad recommendations.

Introduction -- describes the purpose and scope of the audit and identifies both the Regional Audit Team members, key agency personnel, and other section or area leaders who were interviewed. It should also indicate the agency's facilities and monitoring sites which were visited and inspected, together with the dates and times of the on-site audit visit. Acknowledgement of the cooperation and assistance of the Director and the QAO should also be considered for inclusion.

Audit Results -- presents sufficient technical detail to allow a complete understanding of the agency operations. The information obtained during the audit should be organized using the recommended subjects and the specific instructions given below. It will be noted that the report format follows the four-area organization of the short-form questionnaire.

A. Network Design and Siting

1) Network Size --- Provide an overview of the network size and the number of local agencies responsible to the state for network operation.

2) Network Design and Siting --- Describe any deficiencies in network design or probe siting discovered during the audit. Indicate what corrective actions are planned to deal with these deficiencies.

3) Network Audit --- Briefly discuss the conclusions of the last network annual audit and outline any planned network revision resulting from that audit.

4) Non-criteria Pollutants --- Briefly discuss the agency's monitoring and quality assurance activities related to non-criteria pollutants.

B. Resources and Facilities

1) Instruments and Methods --- Describe any instrument non-conformance with the requirements of 40 CFR 50, 51, 53, and 58. Briefly summarize agency needs for instrument replacement over and above non-conforming instruments.

2) Staff and Facilities --- Comment on staff training, adequacy of facilities and availability of NBS-traceable standard materials and equipment necessary for the agency to properly conduct the bi-weekly precision checks and quarterly accuracy audits required under 40 CFR Part 58, Appendix A.

3) Laboratory Facilities --- Discuss any deficiencies of laboratory procedures, staffing and facilities to conduct the tests and analyses needed to implement the SLAMS/NAMS monitoring the Quality Assurance plans.

C. Data and Data Management

1) Data Processing and Submittal --- Comment on the adequacy of the agency's staff and facilities to process and submit SAROAD air quality data as specified in 40 CFR 58.35 and the reporting requirements of 40 CFR 58, Appendices A and F. Include an indication of the timeliness of data submission by indicating the fraction of data which are submitted more than forty-five (45) days late.

2) Data Review --- A brief discussion of the agency's performance in meeting the 75% criteria for data completeness. Additionally, discuss any remedial actions necessary to improve data reporting.

3) Data Correction --- Discuss the adequacy and documentation of corrections and/or deletions made to preliminary ambient air data, and their consistency with both the agency's QA Manual and Standard Operating Procedures, and any revised protocols.

4) Annual Report --- Comment on the completeness, adequacy and timeliness of submission of the SLAMS Annual Report which is required under 40 CFR 58.26.

D. Quality Assurance/Quality Control

1) Status of Quality Assurance Manual --- Discuss the status of the Agency's Quality Assurance Plan. Include an indication of its approval status, the approval status of recent changes and a general discussion of the consistency, determined during the systems audit, between the Agency Standard Operating Procedures and the Quality Assurance Plan.

2) Audit Participation --- Indicate frequency of participation in an audit program. Include as necessary, the agency's participation in the National Performance Audit Program (NPAP) as required by 40 CFR Part 58. Comment on audit results and any corrective actions taken.

3) Accuracy and Precision --- As a goal, the 95 percent probability limits for precision (all pollutants) and TSP accuracy should be less than ±15 percent. At 95 percent probability limits, the accuracy for all other pollutants should be less than ±20 percent. Using a short narrative and a summary table, compare the reporting organization's performance against these goals over the last two years. Explain any deviations.

Discussion -- includes a narrative of the way in which the audit results above are being interpreted. It should clearly identify the derivation of audit results which affect both data quality and overall agency operations, and should outline the basis in regulations and guideline documents for the specific, mutually-agreed upon, corrective action recommendations.

Conclusions and Recommendations -- should center around the overall performance of the agency's monitoring program. Major problem areas should be highlighted. The salient facts of mutually agreed upon corrective action agreements should be included in this section. An equally important aspect to be considered in the conclusion is a determination of the homogeneity of the agency's reporting organizations and the appropriateness of pooling the Precision and Accuracy data within the reporting organizations. The checklist in Figure 11-5 should be included and submitted with the supporting documentation.

Appendix of Supporting Documentation -- contains a clean and legible copy of the completed short-form questionnaire and any Corrective Action Implementation Request Forms (CAIR). Additional documentation may be included if it contributes significantly to a clearer understanding of audit results.

11.4.5 Follow-up and Corrective Action Requirements - An effective corrective action procedure for use by the Regional QA Audit Team follows. As a means of requesting corrective actions identified during the on-site audit, the auditor completes one copy of the form, shown in Figure 11-4, for each major deficiency noted. These CAIR forms are presented to, and discussed with, the agency's Director or his designee, and its QAO during the exit interview. Once Agreement has been reached, both the auditor and the Director sign the form. The original is given to the agency Director or his designee and a copy is retained by the auditor. A photocopy of the completed CAIR is included in the audit report. It is taken to be the responsibility of the agency to comply with agreed-upon corrective action requests in the specified time frame.

11.5 Criteria for the Evaluation of State and Local Agency Performance

This section is designed to assist the Regional Audit Team in interpretation of the completed questionnaire received back from the agency prior to the on-site interviews. It also provides the necessary guidance for topics to be further developed during the on-site interviews.

This section is organized such that the specific topics to be covered and the appropriate technical guidance are keyed to the major subject areas of the long-form questionnaire (Section 11.7). The left-hand side of the page itemizes the discussion topics and the right-hand side provides citations to specific regulations and guideline documents which establish the technical background necessary for the evaluation of agency performance. A more complete bibliography of EPA guideline documents is presented in 11.8.

REPORTING ORGANIZATION HOMOGENEITY CHECKLIST

	Yes	No
1. Field operations, for all local agencies, conducted by a common team of field operators?		
2. Common calibration facilities are used for all local agencies?		
3. Precision checks performed by common staff for all local agencies?		
4. Accuracy checks performed by common staff for all local agencies?		
5. Data handling follows uniform procedures for all local agencies?		
6. Central data processing facilities used for all reporting?		
7. Traceability of all standards established by one central support laboratory?		
8. One central analytical laboratory handles all analyses for manual methods?		

Figure 11-5. Example of Reporting Organization Homogeneity Checklist

11.5.1 Planning -

Topics for Discussion	Background Documents
o General information on reporting organization and status of Air Program, QA Plan and availability of SOPs	o State Implementation Plan o U.S. EPA QAMS 005/80 o Previous Systems Audit report
o Conformance of network design with regulation, and completeness of network documentation	o QA Handbook for Air Pollution Measurement Systems, Vol. II - Ambient Air Specific Methods, Section 2.0.1. o 40 CFR 58 Appendices D and E o OAQPS Siting Documents (available by pollutant)
o Organization staffing and adequacy of educational background and training of key personnel	o QA Handbook for Air Pollution Measurement Systems, Vol. I - Principles, Section 1.4 Vol. II - Ambient Air Specific Methods,Section 2.0.5
o Adequacy of current facilities and proposed modifications	

11.5.2 Field Operations -

Topics for Discussion	Background Documents
o Routine operational practices for SLAMS network, and conformance with regulations	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Section 2.0.9 o QA Handbook for Air Pollution Measurement Systems, Vol. II o 40 CFR 50 plus appendices A through K
o Types of analyzers and samplers used for SLAMS network	o 40 CFR 58 Appendix C - Requirements for SLAMS analyzers

Topics for Discussion	Background Documents
o Adequacy of field procedures, standards used and field documentation employed for SLAMS network	o QA Handbook for Air Pollution Measurement Systems, Vol. II o Instruction Manuals for Designated analyzers
o Frequency of zero/span checks, calibrations and credibility of calibration equipment used	o QA Handbook for Air Pollution Measurement Systems, Vol. II - Ambient Air Specific Methods Section 2.0.9
o Traceability of monitoring and calibration standards	o QA Handbook for Air Pollution Measurement Systems, Vol. II - Ambient Air Specific Methods Section 2.0.7 o 40 CFR 58 Appendix A Section 2.3
o Preventive maintenance system including spare parts, tools and service contracts for major equipment	
o Record keeping to include inspection of some site log books and chain-of-custody procedures	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Section 2.0.6
o Data acquisition and handling system establishing a data audit trail from the site to the central data processing facility	o QA Handbook for Air Pollution Measurement Systems, Vol. II - Ambient Air Specific Methods Sections 2.0.3 and 2.0.9

11.5.3. Laboratory Operations -

Topics for Discussion	Background Documents
o Routine operational practices for manual methods used in SLAMS network to include quality of chemical and storage times.	o 40 CFR 50 Appendices A -B, and QA Handbook, Vol. II

Topics for Discussion	Background Documents
o List of analytical methods used for criteria pollutants and adherence to reference method protocols	o 40 CFR 58 Appendix C; "List of Designated Reference and Equivalent Methods"
o Additional analyses performed to satisfy regional, state or local requirements	o Refer to locally available protocols for analysis of aldehydes, sulfate, nitrate, pollens, hydrocarbons, or other toxic air contaminants
o Laboratory quality control including the regular usage of duplicates, blanks, spikes and multi-point calibrations	o U.S. EPA APTD-1132 "Quality Control Practices in Processing Air Pollution Samples" o 40 CFR 58 Appendix C; "List of Designated Reference and Equivalent Methods"
o Participation in EPA NPAP and method for inclusion of audit materials in analytical run	o 40 CFR 58 Appendix A Section 2.4 o OA Handbook for Air Pollution Measurement Systems, Vol. II, Section 2.0.10 o 40 CFR 58 Appendix C; "List of Designated Reference and Equivalent Methods"
o Documentation and traceability of laboratory measurements such as weighing, humidity and temperature determinations	o 40 CFR 58 Appendix C; "List of Designated Reference and Equivalent Methods"
o Preventive maintenance in the laboratory to include service contracts on major pieces of instrumentation	o 40 CFR 58 Appendix C; "List of Designated Reference and Equivalent Methods"
o Laboratory record keeping and chain-of-custody procedures to include inspection of logbooks used	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Section 2.0.6

Topics for Discussion	Background Documents
o Adequacy of Laboratory facilities, Health and Safety practices and disposal of wastes	o Handbook for Analytical Quality Control in Water and Wastewater Laboratories
o Data acquisition, handling and manipulation system establishing data flow in the laboratory, data back-up system and data reduction steps.	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Sections 2.0.3 and 2.0.9
o Data validation procedures, establishing an audit trail for the laboratory to the central data processing facility	o Annual Book of ASTM Standards, Part 41, 1978. Standard Recommended Practice for Dealing with Outlying Observations (E 178-75)

11.5.4. Data Management -

Topics for Discussion	Background Documents
o Data flow from field and laboratory activities to central data processing facility	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Section 2.0.3
o Extent of computerization of data management system and verification of media changes, transcriptions and manual data entry	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Section 2.0.9
o Software used for processing and its documentation; to include functional description of software, test cases and configuration control for subsequent revisions	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Sections 2.0.3 and 2.0.9
o System back-up and recovery capabilities	

Topics for Discussion	Background Documents
o Data screening, flagging and validation	o Validation of Air Monitoring Data, EPA-600/4-80-030 o Screening Procedures for Ambient Air Quality Data, EPA-450/2-78-037
o Data correction procedures and key personnel allowed to correct ambient air data	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Section 2.0.9
o Reports generated for in-house distribution and for submittal to EPA	
o Responsibility for preparing data for entry into the SAROAD and PARS systems and for responsibility for its final validation prior to submission	o Aeros Manual Series, Vol. II, Aeros User's Manual, EPA-450/2-76-029

11.5.5 QA/QC Program -

Topics for Discussion	Background Documents
o Status of QA Program and its implementation	o 40 CFR 58 Appendix A and QAMS 005/80
o Documentation of audit procedures, integrity of audit devices and acceptance criteria for audit results	o QA Handbook for Air Pollution Measurement Systems, Vol. II, Sections 2.0.11 and 2.0.12
o Participation in the National Performance Audit Program For what pollutants and ranking of results	o 40 CFR 58 Appendix A o QA Handbook for Air Pollution Measurement Systems, Vol. II, Section 2.0.10
o Additional internal audits such as document reviews or data processing audits	

Topics for Discussion	Background Documents
o Procedure and implementation of corrective action	
o Frequency of performance and concentration levels for precision checks for each criteria pollutant	o 40 CFR 58 Appendix A

11.5.6. Reporting -

Topics for Discussion	Background Documents
o Preparation of precision and accuracy summaries for the PARS system	o PARS User's Manual (in preparation) o 40 CFR 58 Appendix A
o Other internal reports used to track performance and corrective action implementation	
o Summary air data reports required by regulations	o 40 CFR 58 Appendices F and G
o Completeness, legibility and validity of P & A data on Form 1	o 40 CFR 58 Appendix A

11.6 Systems Audit Questionnaire (Short-Form)

The short-form questionnaire has been designed specifically for use in annually reviewing state and local agencies air monitoring programs. If the Regional QA Coordinator decides that a more rigorous systems audit and site inspections are necessary, he can utilize appropriate section(s) of the Long-Form Questionnaire (Section 11.7). This questionnaire has been designed around the format recommended by STAPPA/ALAPCO in the National Ambient Air Monitoring Questionnaire and is organized around four (4) major topics consistent with the reporting format outlined in Section 11.4.4. They are:

A. Network Design and Siting
B. Resources and Facilities
C. Data Management, and
D. Quality Assurance and Quality Control

NATIONAL AIR MONITORING SYSTEMS AUDIT QUESTIONNAIRE

(SHORT FORM)

Agency ______________________________

____

Address ______________________________

____

Telephone Number (Area Code) ______ Number ______________

Reporting Period (beginning-ending dates) ______________

Organization Director ______________________________

Air Program Supervisor ______________________________

Data Management Supervisor ______________________________

Quality Assurance Officer ______________________________

Questionnaire Completed ______________________________
(date) (by)

On-Site Visit
Date: ______________ Audit Team Members: ______________

____

Affiliation of Audit Team ______________________________

SHORT FORM QUESTIONNAIRE

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A. NETWORK DESIGN SITING

1. NETWORK SIZE

(a) Complete the table below for each of the criteria pollutants monitored as part of your air monitoring network. Include only those sites that are presently operating and those which are temporarily inoperative (off line less than 30 days). Do not include additional monitors which are collocated or index sites.

Number of Monitors

	SO2	NO2	CO	O3	TSP	PM_{10}	Pb
NAMS	____	____	____	____	____	____	____
SLAMS (excluding NAMS)	____	____	____	____	____	____	____
SPM	____	____	____	____	____	____	____
TOTAL	____	____	____	____	____	____	____

(b) SLAMS Network Description

1. What is the date of the most current official SLAMS Network Description? ______________________________
2. Where is it available for public inspection? ____________________

3. Does it include for each site the following?

	YES	NO
AIRS Site ID#	____	____
Location	____	____
Sampling and Analysis Method	____	____
Operative Schedule	____	____
Monitoring Objective and Scale of Representativeness	____	____
Any Proposed Changes	____	____

(c) For each of the criteria pollutants, how many modifications (SLAMS including NAMS) have been made since the last systems audit? (List the total SLAMS and NAMS)

Date of last systems audit ______________

	Number of Monitors		
Pollutant	Added	Deleted	Relocated
Sulfur Dioxide	________	________	________
Nitrogen Dioxide	________	________	________
Carbon Monoxide	________	________	________
Ozone	________	________	________
Total Suspended Particulates	________	________	________
Lead	________	________	________
PM_{10}	________	________	________

(d) Briefly discuss changes to the Air Monitoring Network planned for the next audit period. (Equipment is discussed in Part B).

2. NETWORK DESIGN AND SITING

Indicate by AIRS Number any non-conformance with the requirements of 40 CFR 58, Appendices D and E.

Monitor	Site ID (AIRS)	Reason for Non-Conformance
SO_2		
O_3		
CO		
NO_2		
TSP		
PM_{10}		
Pb		

3. NETWORK REVIEW

Please provide the following information on your previous internal Network Review required by 40 CFR 58.20d.

Review performed on: Date ______________________________

Performed by: ______________________________

Location and Title of Review Document: ______________________________

____

Briefly discuss all problems uncovered by this review.

4. NON-CRITERIA POLLUTANTS

Does your agency monitor and/or analyze for non-criteria and/or toxic air pollutants? Yes _____ No _____

If yes, please complete the form below.

Pollutant	Monitoring Method/Instrument	SOP Available Yes/No

B. RESOURCES AND FACILITIES

1. INSTRUMENTS AND METHODS

(a) Please complete the table below to indicate which analyzers do not conform with the requirements of 40 CFR 53 for NAMS, SLAMS, or SIP related SPM's.

Pollutant	Number	Make/Model	Site Identification	Comment on Variances
CO				
SO2				
NO2				
O3				
TSP				
PM_{10}				
Pb				

(b) Please comment briefly on your currently identified equipment needs.

2. STAFF AND FACILITIES

(a) Please indicate the number of people available to each of the following program areas:

Program Area	Number	Comment on Need for Additional Personnel
Network Design and Siting		
Resources and Facilities		
Data and Data Management		
QA/QC		

(b) Comment on your agency's needs for additional physical space (laboratory, office, storage, etc.)

3. LABORATORY OPERATION AND FACILITIES

(a) Is the documentation of Laboratory Standard Operating Procedures complete? Yes ______ No ______

Please complete the table below.

Analysis	Date of Last Revision
TSP	
PM_{10}	
Pb	
S04	
N03	
S02 (bubblers)	
N02 (bubblers)	
Others (list by pollutant)	

(b) Is sufficient instrumentation available to conduct your laboratory analyses? Yes _____ No _____

If no, please indicate instrumentation needs in the table below.

Instrument Needed	Analysis	New or Replacement	Year of Acquisition

4. STANDARDS AND TRACEABILITY

(a) Please complete the table for your agency's laboratory standards.

Parameter	Primary Standard	Secondary Standard	Recertification Date
CO			
NO2			
SO2			
O3			
Weights			
Temperature			
Moisture			
Barometric Pressure			
Flow			
Lead			
Sulfate			
Nitrate			
Other (specify)			

(b) Please complete the table below for your agency's site standards (up to 7% of the sites, not to exceed 20 sites).

Parameter	Primary Standard	Secondary Standard	Recertification Date
CO			
NO2			
SO2			
O3			

C. DATA AND DATA MANAGEMENT

1. TIMELINESS OF DATA

For the current calendar year or portion thereof which ended at least 135 calendar days prior to the receipt of this questionnaire, please provide the following percentages for required data submitted.

% Submitted on Time*

Monitoring Qtr.	SO2	CO	O3	NO2	TSP	PM_{10}	Pb
1 (Jan. 1-March 31)							
2 (Apr. 1-June 30)							
3 (July 1-Sept. 30)							
4 (Oct. 1-Dec. 31)							

---

* "On-Time" = within 135 calendar days after the end of the quarter in which the data were collected.

2. DATA REVIEW

What fraction of the SLAMS sites (by pollutant) reported less than 75% of the data (adjusted for seasonal monitoring and site start-ups and terminations)?

Calendar Year ____________

Pollutant	Percent of Sites <75% Data Recovery 1st Quarter	 2nd Quarter	 3rd Quarter	 4th Quarter
Ozone				
Nitrogen Dioxide				
Sulfur Dioxide				
Carbon Monoxide				
Total Suspended Particulates				
PM_{10}				
Lead				

3. DATA CORRECTION

(a) Are changes to submitted data documented in a permanent file?

Yes ____ No ____

If no, why not? ____

____

____

____

(b) Are changes performed according to a documented Standard Operating Procedure or your Agency Quality Assurance Project Plan?

Yes ____ No ____

- If not according to the QA Project Plan, please attach a copy of your current Standard Operating Procedure.

(c) Who has signature authority for approving corrections?

____

(name) (Program Function)

4. ANNUAL REPORT

(a) Please provide the dates annual reports have been submitted in the last two years.

____

(b) Does the agency's annual report (as required in 40 CFR CFR 58.26) include the following?

	YES	NO
1. Data summary required in Appendix F.	____	____
2. Location, date, pollution source and duration of all episodes reaching the significant harm levels.	____	____
3. Certification by a senior officer in the State or his designee.	____	____

(c) Describe any deficiencies which cause the answer to part (b) of this question to be No.

D. QUALITY ASSURANCE/QUALITY CONTROL

1. STATUS OF QUALITY ASSURANCE PROGRAM

(a) Does the agency have an EPA-approved quality assurance program plan?*

Yes _____ No _____

If yes, have changes to the plan been approved by the EPA?

Yes _____ No _____

Please provide:

Date of Original Approval __________________

Date of Last Revision ______________________

Date of Latest Approval ____________________

(b) Do you have any revisions to your QA Program Plan still pending?

Yes _____ No _____

---

* If answer is No, give a brief summary of the deficiencies.

2. AUDIT PARTICIPATION

(a) Date last systems audit was conducted? ____________________

By whom? ______________

(b) Does the agency participate in the National Performance Audit Program (NPAP) as required under 40 CFR 58 Appendix A?*

Yes _____ No _____

(c) Please complete the table below.

Parameter Audited	Date of Last NPAP Audit
SO2 (Continuous)	
CO	
Pb	
ReF Device	
SO2 (bubbler)	
NO2 (bubbler)	

---

* If No, give a brief summary of deficiencies.

3. PRECISION AND ACCURACY GOALS

As a goal, the 95 percent probability limits for precision (all pollutants) and TSP and PM_{10} accuracy should be less than ±15 percent. At 95 percent probability limits, the accuracy for all other pollutants should be less than ±20 percent.* Using a short narrative and a summary table, compare the reporting organization's performance against these goals over the last year. Explain any deviations.

Precision and accuracy are based on reporting organizations; therefore, this question concerns those reporting organizations that are the responsibility of the agency. A copy of a computer printout has been provided which contains the precision and accuracy data submitted to EMSL for each of the agency's reporting organizations. The printout, containing at least the last four completed calendar quarters of precision and accuracy data, was obtained using the NADB program AMP240. This data should be verified using agency records. If found in error, please initiate corrections. Based on the data provided or corrections thereto, complete the table in part "a" below indicating the number of reporting organizations meeting the goals stated above for each pollutant by quarter.

(a) Precision Goals

Pollutant	# of Reporting Organization	Precision			
		Qtr/Yr	Qtr/Yr	Qtr/Yr	Qtr/Yr
O3					
NO2					
SO2					
CO					
TSP					
PM_{10}					
Pb					

---

*While the accuracy goals are important for all audit levels for the gaseous pollutants, the principal concerns are the audit levels that include the ambient standard or the levels just below and just above the standard.

(b) Accuracy Goals

	# of Reporting		Precision		
Pollutant	Organization	Qtr/Yr	Qtr/Yr	Qtr/Yr	Qtr/Yr
O3					
NO2					
SO2					
CO					
TSP					
PM_{10}					
Pb					

(c) To the extent possible, describe problems preventing the meeting of precision and accuracy goals.

11.7 Systems Audit Questionnaire (Long-Form)

The long-form systems audit questionnaire which follows is intended to provide a complete picture of agency ambient air monitoring operations and quality assurance implementation. The following instructions might prove helpful in completing this survey questionnaire.

1. For ease in completing the questionnaire, it is not necessary to type. Filling it out legibly in blank ink is acceptable.
2. Feel free to elaborate on any point or question in the form. Use additional pages as necessary to give a complete response.
3. When necessary, include copies of documents which will aid in understanding your response.
4. Please pay careful attention in completing the questionnaire. The information supplied will have a direct bearing on the conclusions drawn and recommendations made concerning the evaluation of your organization's program.
5. The Regional Quality Assurance Coordinator or a member of his staff may be contacted for assistance in completing the questionnaire.

SYSTEMS AUDIT QUESTIONNAIRE (LONG FORM)
GENERAL INFORMATION

Questionnaire completion date ______________________________
On-site systems audit date ______________________________
Reporting period ______________________________
Agency name and address ______________________________
____
____
Mailing address (if different from above) ______________________________
____
____
Telephone number (FTS) ______________________________
Commercial (___) ______________________________
Agency Director ______________________________
Agency QA Officer ______________________________
Reporting organizations making up this agency ______________________________
____
____
Systems audit conducted by ______________________________
Affiliation of audit team ______________________________

Key Personnel:	Completed Questionnaire	Interviewed
Planning		
Field Operations		
Laboratory Operations		
QA/QC		
Data Management		
Reporting		

Persons Present during exit interview
____
____

LONG FORM QUESTIONNAIRE

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A. NETWORK MANAGEMENT

1. GENERAL

(a) Provide an organization chart clearly showing the agency's structure and its reporting organizations. (Attach sheet(s) as necessary.)

(b) What is the basis for the current structure of the agency's reporting organizations?

	Yes	No
Field operations for all local agencies, conducted by a common team of field operators?	____	____
Common calibration facilities are used for all local agencies?	____	____
Precision checks performed by common staff for all local agencies?	____	____
Accuracy checks performed by common staff for all local agencies?	____	____
Data Handling follows uniform procedures for all local agencies?	____	____
Central data processing facilities used for all reporting?	____	____
Traceability of all standards established by one central support laboratory?	____	____
One central analytical laboratory handles all analyses for manual methods?	____	____

(c) Does the agency feel that the data for the reporting organizations it contains can be pooled?

Yes ____ No ____ Please comment on either answer ____________________

____

(d) Briefly describe any changes which will be made within the agency's monitoring program the next calendar year. ______________________________

____

____

____

(e) Complete the table below for each of the criteria pollutants monitored as part of your air monitoring network.

Number of Monitors

	SO2	NO2	CO	O3	TSP	PM_{10}	Pb
NAMS	____	____	____	____	____	____	____
SLAMS (excluding NAMS)	____	____	____	____	____	____	____
SPM	____	____	____	____	____	____	____
TOTAL	____	____	____	____	____	____	____

(f) What is the date of the most current official SLAMS Network Description? ____________________

I. Where is it available for public inspection? ____________________

II. Does it include for each site the following?

	YES	NO
AIRS Site ID#	____	____
Location	____	____
Sampling and Analysis Method	____	____
Operative Schedule	____	____
Monitoring Objective and Scale of Representativeness	____	____
Any Proposed Changes	____	____

(g) For each of the criteria pollutants, how many modifications (SLAMS including NAMS) have been made since the last systems audit? (List the total SLAMS and NAMS)

Date of last systems audit ______________

	Number of Monitors		
Pollutant	Added	Deleted	Relocated
Sulfur Dioxide			
Nitrogen Dioxide			
Carbon Monoxide			
Ozone			
Total Suspended Particulates			
PM_{10}			
Lead			

(h) Briefly discuss changes to the Air Monitoring Network planned for the next audit period. (Discuss equipment needs in Section B.3.g)

(i) Does an overall SLAMS/NAMS Monitoring Plan exist?

Yes ____ No ____

(j) Has the agency prepared and implemented Standard Operating Procedures for all facets of agency operation? Yes____ No____

If no, list subject of any missing SOPs ____________________________

____

(k) Do the Standard Operating Procedures adequately address at least the fourteen (14) item quality control program required by Appendix A to 40 CFR 58? Yes____ No____ Comment ____________________________________

____

(l) Clearly identify by section number and/or document title, major changes made to documents since the last on-site review.

Title/Section #	Pollutant(s) Affected
____________________________	____________________________
____________________________	____________________________
____________________________	____________________________
____________________________	____________________________

(m) Does the agency have an implemented plan for operations during emergency episodes? Yes ____ No ____ Indicate latest revision, approval date and current location of this plan.

Document Title ____

Revision Date ______________________

Approved _____________________

(n) During episodes, are communications sufficient so that regulatory actions are based on real-time data?

Yes _____ No _____

(o) Identify the section of the emergency episode plan where quality control procedures can be found.

____

____

2. NETWORK DESIGN AND SITING

(a) Indicate by AIRS Number any non-conformance with the requirements of 40 CFR 58, Appendices D and E.

Monitor	Site ID (AIRS)	Reason for Non-Conformance
SO2		
O3		
CO		
NO2		
TSP		
PM_{10}		
Pb		

(b) Please provide the following information on your previous Network Review required by 40 CFR 58.20d.

Review performed on: Date ______________________________

Performed by: ______________________________________

Location and Title of Review Document: ____________________

Briefly discuss all problems uncovered by this review.

(c) Have NAMS Hard Copy Information Reports (NHCIRs) been prepared and submitted for all monitoring sites within the network?
Yes _____ No _____

(d) Does each site have the required information including:

	YES	NO
SAROAD identification number?	____	____
Photographs/slides to the four cardinal compass points?	____	____
Startup and shutdown dates?	____	____
Documentation of instrumentation?	____	____
Reasons for periods of missing data?	____	____

(e) Who has custody of the current network documentation?

____
(Name) (Title)

(f) Does the current level of monitoring effort, site placement, instrumentation, etc., meet requirements imposed by current grant conditions? Yes _____ No _____ Comment ____________________

____

____

(g) How often is the network design and siting reviewed?

____

Date of last review ______________________________

(h) Please provide a summary of the monitoring activities conducted as the SLAMs/NAMS network by the agency as follows:

I. Monitoring is seasonal for (indicate pollutant and month of high and low concentrations).

	Month(s)		
Pollutant	High Concentration	Low Concentration	Collocated
			Y/N
			Y/N
			Y/N
			Y/N
			Y/N
			Y/N

II. Monitoring is year-round for (indicate pollutant)

Pollutant	Collocated
	Y/N
	Y/N
	Y/N
	Y/N
	Y/N

(i) Does the number of collocated monitoring sites meet the requirements of 40 CFR 58 Appendix A?

Yes _____ No _____ Comment _____________________________________

____

(j) Does your agency monitor and/or analyze for non-criteria air and/or toxic air pollutants? Yes _____ No _____

If yes, please complete the form below.

Pollutant	Monitoring Method/Instrument	SOP Available Yes/No

3. ORGANIZATION, STAFFING AND TRAINING

(a) Please indicate the key individuals responsible for the following:

Agency Director ______________________________

SLAMS Network Manager ______________________________

Quality Assurance Officer ______________________________

Field Operations Supervisor ______________________________

Laboratory Supervisor ______________________________

Data Management Supervisor ______________________________

SLAMS Reporting Supervisor ______________________________

(b) Please indicate the number of people available to each of the following program areas:

Program Area	Number	Comment on Need for Additional Personnel
Network Design and Siting		
Resources and Facilities		
Data and Data Management		
QA/QC		

(c) Does the agency have an established training program?

Yes ______ No ______

I. Where is this documented? ____

____
(rev date)

II. Does it make use of seminars, courses, EPA sponsored college level courses? Yes ____ No ____

III. Indicate below the three (3) most recent training events and identify the personnel participating in them?

Event	Dates	Participant(s)
____________________	____________	________________________________
		________________________________
		________________________________
		________________________________
____________________	____________	________________________________
		________________________________
		________________________________
		________________________________
____________________	____________	________________________________
		________________________________
		________________________________
		________________________________

(d) Does the agency subscribe to recognized publications? Please provide a list of periodicals. Are periodicals available to all personnel?

Periodical Title	Distribution
____________	____________
____________	____________
____________	____________
____________	____________
____________	____________
____________	____________

4. FACILITIES

(a) Identify the principal facilities where the work is performed which is related to the SLAMs/NAMS network? (Do not include monitoring sites but do include any work which is performed by contract or other arrangements).

Facility	Location	Main SLAMS/NAMS Function

(b) Please review the entries on the above table. Are there any areas of facilities which you believe should be upgraded? Please identify by location.

(c) Are there any significant changes which are likely to be implemented to agency facilities before the next systems audit? Comment on your agency's needs for additional physical space (laboratory, office, storage, etc.)

Facility	Function	Proposed Change - Date

B. FIELD OPERATIONS

1. ROUTINE OPERATIONS

(a) Is the documentation of Monitoring Standard Operating Procedures complete?

Yes _____ No _____

Please complete the table below.

Pollutant Monitored		Date of Last Revision
TSP		
PM_{10}		
Pb		
SO2	(continuous)	
NO2		
SO2	(bubblers)	
NO2		
O3		
CO		
Others (list by pollutant)		

(b) Are such procedures available to all field operations personnel?

Yes _____ No _____ Comment ____________________________________

____

(c) Are standard operating procedures prepared and available to field personnel which detail operations during episode monitoring?

Yes _____ No _____ Comment ____________________________________

(d) For what does each reporting organization within the agency monitor? Provide the list requested below.

Reporting Organization	# of Sites	Pollutants

(e) On the average, how often are most of your sites visited by a field operator? _____ per _____

(f) Is this visit frequency consistent for all reporting organizations within your agency? Yes _____ No _____

If no, document exceptions ____

____

(g) On the average, how many sites does a single site operator have responsibility for? ____

(h) How many of the sites of your SLAMS/NAMS network are equipped with manifold(s) #_______

I. Briefly describe most common manifold type. ____________________________

II. Are manifolds cleaned periodically? Yes ____ No ____

If yes, how often? __________ per ___________

III. If the manifold is cleaned, what is used? ____________________

____

____

IV. Are manifold(s) equipped with a blower? Yes ____ No ____

V. Is there sufficient air flow through the manifold at all times?
Yes _____ No _____
Approximate air flow is ________________.
(flow units)

VI. Is there a conditioning period for the manifold after cleaning? Briefly comment on the length of time the conditioning is performed.

____

____

____

(i) What material is used for instrument lines? ____________________

____

(j) Has the agency obtained necessary waiver provisions to operate equipment which does not meet the effective reference and equivalency requirements?
Yes _____ No _____

Comment on Agency use of approved/non-approved instrumentation. _______

____

(k) Please complete the table below to indicate which analyzers do not conform with the requirements of 40 CFR 53 for NAMS, SLAMS, or SIP related SPM's.

Pollutant	Number	Make/Model	Site Identification	Comment on Variances
CO				
SO2				
NO2				
O3				
TSP				
PM_{10}				
Pb				

(l) Please comment briefly and prioritize your currently identified instrument needs.

2. QUALITY CONTROL

(a) Are field calibration procedures included in the documented Standard Operating Procedures? Yes ____ No ____

Comment on location (site, lab, office) of such procedures ____________

____

(b) Are multipoint calibrations performed? Indicate both the frequency and pollutant.

Reporting Organization	Pollutant	Frequency

(c) Are calibrations performed in keeping with the guidance offered in Section 2.0.9 Vol. II of the Quality Assurance Handbook for Air Pollution Measurement Systems? Yes _____ No _____

If no, why not? ____

____

(d) Are calibration procedures consistent with the operational requirements of Appendices to 40 CFR 50 or to analyzer operation/instruction manuals? Yes _____ No _____

If no, briefly explain deviations ______________________________________

____

____

(e) Have changes been made to calibration methods based on manufacturer's suggestions for a particular instrument? Yes ____ No ____
Are these also documented? Yes ____ No ____

(f) Do standard materials used for calibrations meet the requirements of the appendices to 40 CFR 50 (EPA reference methods) and Appendix A to 40 CFR 58 (traceability of materials to NBS-SRMs or CRMs)? Yes ____ No ____
Comment on deviations ____________________

____

(g) Are all flow-measurement devices checked and certified?
Yes ____ No ____ Comment ____________________

____

(h) What are the authoritative standards used for each type of flow measurement? Please list them in the table below, indicate the frequency of calibration standards to maintain field material/device credibility.

Flow Devices	Primary Standard	Frequency of Calibration
____	____	____
____	____	____
____	____	____
____	____	____
____	____	____

(i) Where do field operations personnel obtain gaseous standards?

____

Are those standards certified by:	YES	NO
The agency laboratory?	____	____
EPA/EMSL/RTP standards laboratory?	____	____
A laboratory separate from this agency but part of the same reporting organization?	____	____
The vendor?	____	____
NBS?	____	____

(j) Does the documentation include expiration date of certification?
Yes ____ No ____

Reference to primary standard used? Yes ____ No ____

What traceability protocol is used? ________________________________

____

Please attach an example of recent documentation of traceability (tag, label, log sheet). ________________________________

(k) Is calibration equipment maintained at each site? Yes ____ No ____

For what pollutants? ________________________________

____

(l) How is the functional integrity of this equipment documented? ________

____

(m) Please complete the table below for your agency's site standards (up to 7% of the sites, not to exceed 20 sites).

Parameter	Primary Standard	Secondary Standard	Recertification Date
CO			
NO2			
SO2			
O3			

(n) Are level 1 zero and span (z/s) calibrations (or calibration checks) made for all continuous monitoring equipment and flow checks made for TSP samplers? Yes ____ No ____

Please complete table below:

	Pollutant	Span Conc. (ppm)	Frequency
I. Continuous analyzers	________	________	________
	________	________	________
	________	________	________
	________	________	________
	________	________	________
	________	________	________
	________	________	________

	Flow Rate	Frequency
II. TSP Samplers	________	________
	________	________
	________	________
	________	________
	________	________

	Flow Rate	Frequency
III. PM_{10} Samplers	________	________
	________	________
	________	________
	________	________
	________	________

(o) Does the agency have acceptance criteria for zero/span checks?
Yes _____ No _____ Comment ____

____

I. Are these criteria known to the field operations personnel?
Yes _____ No _____

II. Are they documented in standard operating procedures?
Yes _____ No _____

If not, indicate document and section where they can be found.

____

III. Do the documents discussed in (ii) above indicate when zero/span adjustments should and should not be made? Yes ____ No ____
Indicate an example ____

IV. Are zero and span check control charts maintained? Yes ___ No ___

(p) In keeping with 40 CFR 58 regulations, are any necessary zero and span adjustments made after precision checks? Yes ____ No ____

If no, comment on why not ____

____

(q) Are precision check control charts maintained? Yes ____ No ____

(r) Who has the responsibility for performing zero/span checks?

____

(s) Are precision checks routinely performed within concentration ranges and with a frequency which meet or exceed the requirements of 40 CFR 58, Appendix A? Yes ____ No ____

Please comment on any discrepancies. ______________________________

____

____

(t) Please identify person(s) with the responsibility for performance of precision checks on continuous analyzers?

Person(s) ____

Title ____

3. PREVENTIVE MAINTENANCE

(a) Has the field operator been given any special training in performing preventive maintenance? Briefly comment on background and/or courses

____

____

(b) Is this training routinely reinforced? Yes _____ No _____

If no, why not? ____

(c) If preventive maintenance is MINOR, it is performed at (check one or more): field site ____, headquarters facilities ____, equipment is sent to manufacturer ____.

(d) If preventive maintenance is MAJOR, it is performed at (check one or more): field site ____, headquarters facilities ____, equipment is sent to manufacturer ____.

(e) Does the agency have service contracts or agreements in place with instrument manufacturers? Indicate below or attach additional pages to show which instrumentation is covered.

____

____

____

(f) Comment briefly on the adequacy and availability of the supply of spare parts, tools and manuals available to the field operator to perform any necessary maintenance activities. Do you feel that this is adequate to prevent any significant data loss? ______________________________

____

____

(g) Is the agency currently experiencing any recurring problem with equipment or manufacturer(s)? If so, please identify the equipment and/or manufacturer, and comment on steps taken to remedy the problem.

____

____

____

____

____

____

4. RECORDKEEPING

(a) Is a log book(s) maintained at each site to document site visits, preventive maintenance and resolution of site operational problems and corrective actions taken? Yes ____ No ____ Other uses ______________

____

(b) Is the logbook maintained currently and reviewed periodically? Yes ____ No ____ Frequency of Review ______________________________

(c) Once entries are made and all pages filled, is the logbook sent to the laboratory for archiving? Yes ____ No ____

If no, is it stored at other location (specify)

____

____

(d) What other records are used?	YES	NO
Zero/span record?	____	____
Gas usage log?	____	____
Maintenance log?	____	____
Log of precision checks?	____	____
Control charts?	____	____
A record of audits?	____	____

Please describe the use and storage of these documents.

____

____

(e) Are calibration records or at least calibration constants available to field operators? Yes ____ No ____ Please attach an example field calibration record sheet to this questionnaire.

5. DATA ACQUISITION AND HANDLING

(a) With the exception of TSP, are instrument outputs (that is data) recorded to (a) stripcharts, (b) magnetic tape acquisition system (c) digitized and telemetered directly to agency headquarters? Please complete the table below for each of the reporting organizations, or agencies within the overall R.O.

Reporting Organization	Pollutants	Data Acquisition Media (a, b, c or combination)

(b) Is there stripchart backup for all continuous analyzers? Yes ___ No ___

(c) Where is the flow of high-volume samplers recorded at the site?

For samplers with flow controllers? Log sheet ___, Dixon chart ___, Other ___ (specify)

On High-volume samplers without flow controllers? Log sheet ___, Dixon chart ___, Other ___ (specify)

(d) What kind of recovery capabilities for data acquisition equipment are available to the field operator after power outages, storms, etc? Briefly describe below.

____

____

____

(e) Using a summary flow diagram, indicate below all data handling steps performed at the air monitoring site. Identify the format, frequency and contents of data submittals to the data processing section. Clearly indicate points at which flow path differs for different criteria pollutants. Be sure to include all calibration, zero/span and precision check data flow paths. How is the integrity of the data handling system verified?

C. LABORATORY OPERATIONS

1. ROUTINE OPERATIONS

(a) What analytical methods are employed in support of your air monitoring network?

Analysis	Methods
TSP	
PM_{10}	
Pb	
SO4	
NO3	
SO2 (bubblers)	
NO2	
Others (list by pollutant)	

(b) Are bubblers used for any criteria pollutants in any agencies?
Yes ____ No ____ If yes, attach a table which indicates the number of sites where bubblers are used, the agency and pollutant(s).

(c) Do any laboratory procedures deviate from the reference, equivalent, or approved methods? Yes ____ No ____ If yes, are the deviations for lead analysis _____, TSP filter conditioning _____ or other--- (specify below)?

____

____

(d) Have the procedures and/or any changes been approved by EPA? Yes _______
No ____ Date of Approval ______________________________

(e) Is the documentation of Laboratory Standard Operating Procedures complete? Yes ____ No ____. Please complete the table below.

Analysis	Methods
TSP	
PM_{10}	
Pb	
SO4	
NO3	
SO2 (bubblers)	
NO2	
Others (list by pollutant)	

(f) Is sufficient instrumentation available to conduct your laboratory analyses? Yes ____ No ____. If no, please indicate instrumentation needs in the table below.

Instrument Needed	Analysis	New or Replacement	Year of Acquisition

2. QUALITY CONTROL

(a) Please complete the table for your agency's laboratory standards.

Parameter	Primary Standard	Secondary Standard	Recertification Date
CO			
NO2			
SO2			
O3			
Weights			
Temperature			
Moisture			
Barometric Pressure			
Flow			
Lead			
Sulfate			
Nitrate			
VOC			

(b) Are all chemicals and solutions clearly marked with an indication of shelf life? Yes _____ No ____

(c) Are chemicals removed and properly disposed of when shelf life expires? Yes ____ No ____

(d) Are only ACS chemicals used by the laboratory? Yes ____ No ____

(e) Comment on the traceability of chemicals used in the preparation of calibration standards? ____

____

____

(f) Does the laboratory:

purchase standard solutions such as those for use with lead or other AA analysis? Yes ____ No ____

make them themselves? Yes ____ No ____

if the laboratory staff routinely make their own standard solutions, are procedures for such available? Yes ____ No ____ Where? Attach an example.

(g) Are all calibration procedures documented? Yes _____ No _____

Where? ______________________ ______________________
(title) (revision)

Unless fully documented, attach a brief description of a calibration procedure.

(h) Are at least one duplicate, one blank, and one standard or spike included with a given analytical batch? Yes ____ No ____ Identify analyses for which this is routine operation?

____

____

(i) Briefly describe the laboratory's use of data derived from blank analyses?

____

____

____

____

Do criteria exist which determine acceptable/non-acceptable blank data? Please complete the table below.

Pollutant	Blank Acceptance Criteria
SO2	
NO2	
SO4	
NO3	
Pb	
PM_{10}	
TSP	
VOC	
Other	

(j) How frequently and at what concentration ranges does the lab perform duplicate analysis? What constitutes acceptable agreement? Please complete the table below.

Pollutant	Frequency	Acceptance Criteria
SO2 Bubblers		
NO2 Bubblers		
SO4		
NO3		
Pb		
PM_{10}		
TSP		
VOC		
Other		

(k) How does the lab use data from spiked samples? Please indicate what may be considered acceptable percentage recovery by Analysis? Please complete the table below.

Pollutant	% Recovery Acceptance Criteria
SO2 Bubblers	
NO2 Bubblers	
SO4	
NO3	
Pb	
PM_{10}	
TSP	
VOC	
Other	

(l) Does the laboratory routinely include samples of reference material obtained from EPA within an analytical batch? Yes ____ No ____

If yes, indicate frequency, level, and material used. ________________

____

(m) Are mid-range standards included in analytical batches? Yes ___ No ____ If yes, are such standards included as a QC check (span check) on analytical stability? Please indicate the frequency, level and compound used in the space provided below. ______________________

____

____

____

(n) Do criteria exist for "real-time" quality control based on the results obtained for the mid-range standards discussed above? Yes ___ No ____ If yes, briefly discuss them below or indicate the document in which they can be found.

____

____

(o) Are appropriate acceptance criteria documented for each type of analysis conducted? Yes ____ No ____ Are they known to at least the analysts working with respective instruments?

3. PREVENTIVE MAINTENANCE

(a) For laboratory equipment, who has responsibility for major and/or minor preventive maintenance?

Person ____________________ Title ________________________

(b) Is most maintenance performed:

in the lab? Yes ____ No ____

in the instrument repair facility? Yes ____ No ____

at the manufacturer's facility? Yes ____ No ____

(c) Is a maintenance log maintained for each major laboratory instrument?

Yes ____ No ____ Comment ______________________________

____

(d) Are service contracts in place for the following analytical instruments:

	YES	NO
Analytical Balance	____	____
Atomic Absorption Spectrometer	____	____
Ion Chromatograph	____	____
Automated Colorimeter	____	____
____________________	____	____
____________________	____	____

4. RECORDKEEPING

(a) Are all samples that are received by the laboratory:

logged-in? Yes ____ No ____

assigned a unique laboratory sample number? Yes ____ No ____

routed to the appropriate analytical section? Yes ____ No ____

Discuss sample routing and special needs for analysis (or attach a copy of the latest SOP which covers this). Attach a flow chart if possible.

____

____

____

(b) Are logbooks kept for all analytical laboratory instruments?
Yes ____ No ____

(c) Do these logbooks indicate:

	YES	NO
analytical batches processed?	____	____
quality control data?	____	____
calibration data?	____	____
results of blanks, spikes and duplicates?	____	____
initials of analyst?	____	____

(d) Is there a logbook which indicates the checks made on:

weights? Yes ____ No ____

humidity indicators? Yes ____ No ____

balances? Yes ____ No ____

thermometer(s)? Yes ____ No ____

(e) Are logbooks maintained to track the preparation of filters for the field?
Yes _____ No _____

Are they current? Yes ____ No ____

Do they indicate proper use of conditioning? Yes ____ No ____

Weighings? Yes ____ No ____

Stamping and numbering? Yes ____ No ____

(f) Are logbooks kept which track filters returning from the field for analysis? Yes ____ No ____

(g) How are data records from the laboratory archived?

Where? ____

Who has the responsibility? Person ______________________

Title ____

How long are records kept? Years ______________________

(h) Does a chain-of-custody procedure exist for laboratory samples?
Yes _____ No _____

(i) Has chain-of-custody been documented and implemented as part of standard laboratory procedures? Yes ____ No ____ If yes, indicate date, title and revision number where is can be found.

____

____

5. DATA ACQUISITION AND HANDLING

(a) Identify those laboratory instruments which make use of computer interfaces directly to record data? Which ones use stripcharts? integrators?

(b) Are QC data readily available to the analyst during a given analytical run? Yes ____ No ____

(c) For those instruments which are computer interfaced, indicate which are backed up by stripcharts? ____

(d) What is the laboratory's capability with regard to data recovery? In case of problems, can they recapture data or are they dependent on computer operations? Discuss briefly.

(e) Has a user's manual been prepared for the automated data acquisition instrumentation? Yes ____ No ____ Comment ____

Is it in the analyst's or user's possession? Yes ____ No ____

Is it current? Yes ____ No ____

(f) Please provide below a data flow diagram which establishes, by a short summary flow chart; transcriptions, validations, and reporting format changes the data goes through before being released to the data management group. Attach additional pages as necessary.

6. SPECIFIC POLLUTANTS: TSP, PM_{10}, AND LEAD

TSP

(a) Are filters supplied by EPA used at SLAMS sites? Yes ____ No ____

Comment ____________________

(b) Do filters meet the specifications in the Federal Register 40 CFR 50?

Yes ____ No ____ Comment ____________________

____

(c) Are filters checked for surface alkalinity? Yes ____ No ____

Indicate frequency ____________________

(d) Are filters visually inspected via strong light from a view box for pinholes and other imperfections? Yes ____ No ____
If no, comment on way imperfections are determined? ____________________

____

(e) Are filters permanently marked with a serial number? Yes ____ No ____

Indicate when and how this is accomplished: ____________________

____

(f) Are unexposed filters equilibrated in controlled conditioning environment which meets or exceeds the requirements of 40 CFR 50? Yes ___ No ___
If no, why not?

____

____

(g) Is the conditioning environment monitored? Yes ____ No ____
Indicate frequency ____________________

Are the monitors properly calibrated? Yes ____ No ____
Indicate frequency ____________________

(h) Is the balance checked with Class "S" weights each day it is used?
Yes ____ No ____ If no, indicate frequency of such checks

____

(i) Is the balance check information placed in QC logbook? Yes ____ No ____
If no, where is it recorded? ________________________________

____

(j) Is the filter weighed to the nearest milligram? Yes ____ No ____
If not, what mass increment ____________________

(k) Are filter serial numbers and tare weights permanently recorded in a bound notebook? Yes ____ No ____

If no, indicate where ______________________________________

(l) Are filters packaged for protection while transporting to and from the monitoring sites? Yes ____ No ____

(m) How often are filter samples collected? (Indicate average lapse time (hrs.) between end of sampling and laboratory receipt.)

____

____

(n) Are field measurements recorded in logbook or on filter folder?

____

(o) Are exposed filters reconditioned for at least 24 hrs in the same conditioning environment as for unexposed filters? Yes ____ No ____

If no, why not? ____

____

(p) Are exposed filters removed from folders, etc., before conditioning?
Yes ____ No ____

(q) Is the exposed filter weighed to the nearest milligram? Yes ___ No ___

(r) Are exposed filters archived? Yes ____ No ____ When? ______________

Where? ____

Indicate retention period ____

____

(s) Are blank filters reweighed? Yes ____ No ____ If no, explain why not.

____

____

If yes, how frequently? ____

(t) Are analyses performed on filters? Yes ____ No ____. Indicate analyses other than Pb and mass which are routinely performed. ________________

____

____

(u) Are sample weights and collection data recorded in a bound laboratory logbook? Yes ____ No ____ On data forms? Yes ____ No ____

(v) Are measured air volumes corrected to reference conditions as given in CFR regulations (Qstd of 760 mm Hg and 25oC) prior to calculating the Pb concentration? Yes ____ No ____

If not, indicate conditions routinely employed for both internal and external reporting ____

____

PM_{10}

(a) Are filters supplied by EPA used at SLAMS sites? Yes ____ No ____

Comment ______________________________

(b) Do filters meet the specifications in the Federal Register 40 CFR 50?

Yes ____ No ____ Comment ______________________________

____

(c) Are filters checked for surface alkalinity? Yes ____ No ____

Indicate frequency ______________________________

(d) Are filters visually inspected via strong light from a view box for pinholes and other imperfections? Yes ____ No ____
If no, comment on way imperfections are determined? ______________________________

____

(e) Are filters permanently marked with a serial number? Yes ____ No ____

Indicate when and how this is accomplished: ______________________________

____

(f) Are unexposed filters equilibrated in controlled conditioning environment which meets or exceeds the requirements of 40 CFR 50? Yes ___ No ___
If no, why not?

____

____

(g) Is the conditioning environment monitored? Yes ____ No ____
Indicate frequency ______________________________

Are the monitors properly calibrated? Yes ____ No ____
Indicate frequency ______________________________

(h) Is the balance checked with Class "S" weights each day it is used?
Yes ____ No ____ If no, indicate frequency of such checks

____

(i) Is the balance check information placed in QC logbook? Yes ____ No ____
If no, where is it recorded? ______________________________________

____

(j) Is the filter weighed to the nearest milligram? Yes ____ No ____
If not, what mass increment ______________________

(k) Are filter serial numbers and tare weights permanently recorded in a bound notebook? Yes ____ No ____

If no, indicate where ____

(l) Are filters packaged for protection while transporting to and from the monitoring sites? Yes ____ No ____

(m) How often are filter samples collected? (Indicate average lapse time (hrs.) between end of sampling and laboratory receipt.)

____

____

(n) Are field measurements recorded in logbook or on filter folder?

____

(o) Are exposed filters reconditioned for at least 24 hrs in the same conditioning environment as for unexposed filters? Yes ____ No ____

If no, why not? ____

____

(p) Are exposed filters removed from folders, etc., before conditioning?
Yes ____ No ____

(q) Is the exposed filter weighed to the nearest milligram? Yes ___ No ___

(r) Are exposed filters archived? Yes ____ No ____ When? _______________

Where? ____

Indicate retention period ____

____

(s) Are blank filters reweighed? Yes ____ No ____ If no, explain why not.

____

____

If yes, how frequently? ____

(t) Are analyses performed on filters? Yes ____ No ____. Indicate analyses other than Pb and mass which are routinely performed. _________________

____

____

(u) Are sample weights and collection data recorded in a bound laboratory logbook? Yes ____ No ____ On data forms? Yes ____ No ____

(v) Are measured air volumes corrected to reference conditions as given in CFR regulations (Qstd of 760 mm Hg and 25oC) prior to calculating the Pb concentration? Yes ____ No ____

If not, indicate conditions routinely employed for both internal and external reporting ____

____

LEAD

(a) Is analysis for lead being conducted using atomic absorption spectrometry with air acetylene flame? Yes ____ No ____
If not, has the agency received an equivalency designation of their procedure. ____

____

____

(b) Is either the hot acid or ultrasonic extraction procedure being followed precisely? Yes ____ No ____ Which? ______________________

____

(c) Is Class A borosilicate glassware used throughout the analysis?
Yes ____ No ____

(d) Is all glassware scrupulously cleaned with detergent, soaked and rinsed three times with distilled-deionized water? Yes ____ No ____
If not, briefly describe or attach procedure.

____

____

____

(e) If extracted samples are stored, are linear polyethlyene bottles used?
Yes ____ No ____ Comment ______________________________

____

(f) Are all batches of glass fiber filters tested for background lead content?
Yes ____ No ____ At a rate of 20 to 30 random filters per batch of 500 or greater? Yes ____ No ____ Indicate rate

____

(g) Are ACS reagent grade HNO3 and HCl used in the analysis? Yes ____
No ____ If not, indicate grade used ______________________

____

(h) Is a calibration curve available having concentrations that cover the linear absorption range of the atomic absorption instrumentation?
Yes ____ No ____ Briefly describe ________________________________

____

____

(i) Is the stability of the calibration curve checked by alternately remeasuring every every 10th sample a concentration =1 ug Pb/ml; =10 ug Pb/ml? Yes ____ No ____ If not, indicate frequency.

____

____

(j) Are measured air volumes corrected to reference conditions as given in CFR regulations (Qstd of 760 mm Hg and 25oC) prior to calculating the Pb concentration? Yes ____ No ____ If not, indicate conditions routinely employed for both internal and external reporting.

____

____

(k) In either the hot or ultrasonic extraction procedure, is there always a 30-min H2O soaking period to allow HNO3 trapped in the filter to diffuse into the rinse water? Yes ____ No ____ Comment ____________

____

(l) Is a quality control program in effect that includes periodic quantification of (1) lead in 3/4" x 8" glass fiber filter strips containing 100-300 ug Pb/strip, and/or (2) a similar strip with 600-1000 ug strip, and (3) blank filter strips with zero Pb content to determine if the method, as being used, has any bias? Yes ____ No ____
Comment on lead QC program or attach applicable SOP. ____________________

____

____

____

(m) Are blank Pb values subtracted from Pb samples assayed? Yes ___ No ___

If not, explain why. ____

____

D. DATA AND DATA MANAGEMENT

1. DATA HANDLING

(a) Is there a procedure, description, or a chart which shows a complete data sequence from point of acquisition to point of submission of data to EPA?
Yes _____ No _____

Please provide below a data flow diagram indicating both the data flow within the reporting organization and the data received from the various local agencies.

(b) Are data handling and data reduction procedures documented?

For data from continuous analyzers? Yes ____ No ____

For data from non-continuous methods? Yes ____ No ____

(c) In what format and medium are data submitted to data processing section? Please provide separate entry for each reporting organization.

Reporting Organization	Data Medium	Format

(d) How often are data received at the processing center from the field sites and laboratory?

at least once a week? ____

every 1-2 weeks? ____

once a month? ____

(e) Is there documentation accompanying the data regarding any media changes, transcriptions, and/or flags which have been placed into the data before data are released to agency internal data processing? Describe.

____

____

____

____

(f) How are the data actually entered to the computer system? Digitization of stripcharts? Manual or computerized transcriptions? Other?

(g) Is a double-key entry system used for data at the processing center? Are duplicate card decks prepared? Yes ____ No ____ If no, why not?

(h) Have special data handling procedures been adopted for air pollution episodes? Yes ____ No ____ If yes, provide brief description.

2. SOFTWARE DOCUMENTATION

(a) Does the agency have available a copy of the AIRS Users Manual?

Yes ____ No ____ Comment ____

(b) Does the agency have the PARS user's guide available? Yes ___ No ____

Comment (provide guide #) ____

____

(c) Does the Data Management Section have complete software documentation?
Yes _____ No _____ Comment ____

If yes, indicate the implementation date and latest revision dates for such documentation. ____

____

____

____

____

(d) Do the documentation standard follow the guidance offered by the EPA Software Documentation Protocols? Yes ____ No ____

If no, what protocols are they based on? ____________________________

____

____

(e) What is the origin of the software used to process air monitoring data prior to its release into the AIRS/NADB database?

I. Purchased? Yes ___ No ___; Supplier ______________________________

Date of latest version ____

II. Written in-house? Yes ___ No ___; Latest version _________________

Date ____

III. Purchased with modifications in-house? Yes ____ No ____;

Latest version ________________________ Date ____________________

IV. Other (specify) _________

(f) Is a user's manual available to data management personnel for all software currently in use at the agency for processing SLAMS/NAMS data?

Yes ____ No ____ Comment ____

____

(g) Is there a functional description either:

included in the user's manual? Yes ____ No ____

separate from it and available to the users? Yes ____ No ____

(h) Are the computer system contents, including ambient air monitoring data, backed up regularly? Briefly describe, indicating at least the media, frequency, and backup-media storage location. _________________________

____

____

(i) What is the recovery capability (how much time and data would be lost) in the event of a significant computer problem? ____________________

(j) Are test data available to evaluate the integrity of the software?

Yes ____ No ____ Is it properly documented? Yes ____ No ____

Reference	Report Title
EPA-600/4-77-027a May 1977	QA Handbook for Air Pollution Measurement Systems, Vol. II - Ambient Air Specific Methods
EPA-450/3-77-013 April 1977	Optimum Site Exposure Criteria for SO2 Monitoring
EPA-450/2-76-029 December 1976	Aeros Manual Series, Vol. II - Aeros User's Manual
EPA-450/2-76-005 April 1976	Aeros Manual Series, Vol. V - Aeros Manual of Codes
EPA-600/9-76-005 March 1976	QA Handbook for Air Pollution Measurement Systems, Vol. I - Principles
EPA-450/2-76-001 February 1976	Aeros Manual Series, Vol. I - Aeros Overview
EPA-450/3-75-077 September 1975	Selecting Sites for Carbon Monoxide Monitoring
APTD-1132 March 1973	Quality Control Practices in Processing Air Pollution Samples
47 FR 54912, Dec. 6, 1982; 48 FR 17355, Apr. 22, 1983	Amendments to reference methods for SO2, TSP and CO in 40 CFR Part 50 Appendices A, B, and C

Proposed amendments to 40 CFR Part 58 are pending.

Proposed revision (Handbook, Vol. II, Sections 2.0.7 and 2.0.9 are pending.

3. DATA VALIDATION AND CORRECTION

(a) Have validation criteria, applicable to all pollutant data processed by the reporting organization been established and documented? Yes _____ No _____

If yes, indicate document where such criteria can be found (title, revision date). ______________________________

____

(b) Does documentation exist on the identification and applicability of flags (i.e. identification of suspect values) within the data as recorded with the data in the computer files? Yes _____ No _____

(c) Do documented data validation criteria employed address limits on and for the following:

I. Operational parameters, such as flow rate measurements or flow rate changes. ______________________________

____

II. Calibration raw data, calibration validation and calibration equipment tests. ______________________________

____

III. All special checks unique to a measurement system ______________________________

____

IV. Tests for outliers in routine data as part of screening process

____

____

V. Manual checks such as hand calculation of concentrations and their comparison with computer-calculated data ______________________________

____

____

(d) Are changes to data submitted to NADB documented in a permanent file?

Yes ____ No ____ If no, why not? ________________________________

____

____

____

(e) Are changes performed according to a documented Standard Operating Procedure or your Agency Quality Assurance Project Plan? Yes ___ No ___

If not according to the QA Project Plan, please attach a copy of your current Standard Operating Procedure.

(f) Who has signature authority for approving corrections?

____
(name) (Program Function)

(g) Are data validation summaries prepared at each critical point in the measurement process or information flow and forwarded with the applicable block of data to the next level of validation? Yes ____ No ____

Please indicate the points where such summaries are performed.

____

____

(h) What criteria are applied for data to be deleted? Discuss briefly.

____

____

____

(i) What criteria are applied to cause data to be reprocessed? Discuss.

____

____

____

(j) Is the group supplying data provided an opportunity to review data and correct erroneous entries? Yes ____ No ____ If yes, how?

____

____

(k) Are correct data resubmitted to the issuing group for cross-checking prior to release? Yes ____ No ____

4. DATA PROCESSING

(a) Does the agency generate data summary reports? Yes ____ No ____

Are the data used for in-house distribution and use? Yes ____ No ____

Publication? Yes ____ No ____

Other (specify) ____

____

(b) Please list at least three (3) reports routinely generated, providing the information requested below.

Report Title	Distribution	Period Covered

(c) Have special procedures been instituted for pollution index reporting? Yes ____ No ____ If yes, provide brief description.

____

____

____

(d) Who at the agency has the responsibility for submitting data to SAROAD/NADB? (name) ____________ (title) ____________

Is the data reviewed and approved by an officer of the agency prior to submittal? Yes ____ No ____

(name) ____________ (title) ____________

(e) Are those persons different from the individuals who submit data to PARS? Yes ____ No ____ If yes, provide name and title of individual responsible for PARS data submittal.

(name) ________________________ (title) ______________________ PARS

Data review and approval (name) ____

(title) ____

(f) How often are data submitted to:

AIRS? ____

PARS? ____

(g) How and/or in what form are data submitted?

TO AIRS? ____

TO PARS? ____

(h) Are the recommendations and requirements for data coding and submittal, in the AIRS User's Manual followed closely for AIRS? Yes ___ No ___ Comment on any routine deviations in coding procedures.

____

____

(i) Are the recommendations and requirements for data coding and submittal, in the PARS User's Guide, followed closely? Yes _____ No _____ Comment on any routine deviations in coding and/or computational procedures.

____

____

(j) Does the agency routinely request a hard copy printback on submitted data;

from AIRS/NADB? Yes ____ No ____

from PARS? Yes ____ No ____

(k) Are records kept for at least 3 years by the agency in an orderly, accessible form? Yes ____ No ____

If yes, does this include raw data ___, calculation ___, QC data ___, and reports ___? If no, please comment.

____

____

(l) In what format are data received at the data processing center? (Specify appropriate pollutant.)

(a) concentration units ___ (b) % chart ___ (c) voltages ___ (d) other;

(m) Do field data include the following documentation?

Site ID? Yes ___ No ___

Pollutant type? Yes ___ No ___

Date received at the center? Yes ___ No ___

Collection data (flow, time, date)? Yes ___ No ___

Date of Laboratory Analysis (if applicable) Yes ___ No ___

Operator/Analyst? Yes ___ No ___

(n) Are the appropriate calibration equations submitted with the data to the processing center? Yes ___ No ___ If not, explain.

____

____

____

(o) Provide a brief description of the procedures and appropriate formulae used to convert field data to concentrations prior to input into the data bank.

SO2

NO2

CO

O3

TSP

CH4/THC

Pb ____

____

____

PM_{10} ____

____

____

Other ____

____

____

(p) Are all concentrations corrected to EPA standard (298oK, 760 mm Hg) temperature and pressure condition before input to the SAROAD?

Yes ____ No ____ If no, specify conditions used ________________

____

(q) Are data reduction audits performed on a routine basis? Yes ___ No ____ If yes,

at what frequency? ________________________________

are they done by an independent group? ________________

____

(r) Are there special procedures available for handling and processing precision, accuracy, calibrations and span checks? Yes ____ No ____

If no, comment ____________________________________

____

If yes, provide a brief description:

Span check data ___________________________________

Calibration data __________________________________

Precision data ____

Accuracy data ____

(s) Are precision and accuracy data checked each time they are recorded, calculated or transcribed to ensure that incorrect values are not submitted to EPA? Yes ___ No ___ Please comment and/or provide a brief description of checks performed. ____________________________________

____

____

____

(t) Is a final data processing check performed prior to submission of any data? Yes ____ No ____

If yes, document procedure briefly ______________________________

____

____

If no, explain ____

____

5. INTERNAL REPORTING

(a) What reports are prepared and submitted as a result of the audits required under 40 CFR 58 Appendix A?

Report Title	Frequency

(Please include an example audit report and, by attaching a coversheet, identify the distribution such reports are given within the agency.)

(b) What internal reports are prepared and submitted as a result of precision checks also required under 40 CFR 58 Appendix A?

Report Title	Frequency

(Please include an example of a precision check report and, identify the distribution such reports receive within the agency.)

(c) Do either the audit or precision reports indicated include a discussion of corrective actions initiated based on audit or precision results?

Yes ____ No ____ If yes, identify report(s) and section numbers.

____

____

(d) Does the agency prepare Precision and Accuracy summaries other than Forms for Precision and Accuracy included in Appendix A of 40 CFR 58.
Yes ____ No ____ If no, please attach examples of recent summaries including a recent Precision and Accuracy.

(e) Who has the responsibility for the calculation and preparation of data summaries? To whom are such P and A summaries delivered?

Name	Title	Type of Report	Recipient

(f) Identify the individual within the agency who receives the results of the agency's participation in the NPAP and the internAL distribution of the results once received.

Principal Contact for NPAP is (name, title)

____

Distribution is ______________________________

____

____

____

____
(name) (title)

6. EXTERNAL REPORTING

(a) For the current calendar year or portion thereof which ended at least 135 calendar days prior to the receipt of this questionnaire, please provide the following percentages for required data submitted.

% Submitted on Time*

Monitoring Qtr.	SO_2	CO	O_3	NO_2	TSP	PM_{10}	Pb
1(Jan. 1 - March 31)							
2(Apr. 1 - June 30)							
3(July 1 - Sept. 30)							
4(Oct. 1 - Dec. 31)							

*"On-Time" = within 135 calendar days after the end of the quarter in which the data were collected.

(b) Identify the individual within the agency with the responsibility for preparing the required 40 CFR 58 Appendix F and G reporting inputs.

Name ______________________ Title ______________________

(c) Identify the individual within the agency with the responsibility for reviewing and releasing the data.

Name ______________________ Title ______________________

(d) Does the agency regularly report the Pollutant Standard Index (PSI)? Briefly describe the media, coverage, and frequency of such reporting.

(e) What fraction of the SLAMS sites (by pollutant) reported less than 75% of the data (adjusted for seasonal monitoring and site start-ups and terminations)?

FY________

Pollutant	Percent of Sites <75% Data Recovery 1st Quarter	 2nd Quarter	 3rd Quarter	 4th Quarter
Ozone				
Nitrogen Dioxide				
Sulfur Dioxide				
Carbon Monoxide				
Total Suspended Particulates				
PM_{10}				
Lead				

(f) Does the agency's annual report (as required in 40 CFR CFR 58.26) include the following?

	YES	NO
Data summary required in Appendix F.	____	____
Location, date, pollution source and duration of all episodes reaching the significant harm levels.	____	____
Certification by a senior officer in the State or his designee.	____	____

(g) Please provide the dates at which the annual reports have been submitted for the last 2 years.

E. QUALITY ASSURANCE/QUALITY CONTROL

1. STATUS OF QUALITY ASSURANCE PROGRAM

(a) Does the agency have an EPA-approved quality assurance program plan?

Yes _____ No _____

If yes, have changes to the plan been approved by the EPA? Yes ___ No ___

Please provide:

Date of Original Approval ________________

Date of Last Revision ____________________

Date of Latest Approval __________________

(b) Do you have any revisions to your QA Program Plan still pending?

Yes _____ No _____

(c) Is the QA Plan fully implemented? Yes ____ No ____ Comment:

____

____

(d) Are copies of QA Plan or pertinent sections available to agency personnel?

Yes _____ No _____ If no, why not? ___________________________

____

(e) Which individuals routinely receive updates to QA Plan?

____

____

____

____

2. AUDITS AND AUDIT SYSTEM TRACEABILITY

(a) Does the agency maintain a separate audit/calibration support facility laboratory? Yes ____ No ____

(b) Has the agency documented and implemented specific audit procedures?

Yes ____ No ____

(c) Have audit procedures been prepared in keeping with the requirements of Appendix A to 40 CFR 58? Yes ____ No ____

If no, comment on any EPA approved deviations ____________________

____

____

(d) Do the procedures meet the specific requirements for independent standards and the suggestions regarding personnel and equipment? Yes ___ No ___
Comment:

____

(e) Are SRM or CRM materials used to routinely certify audit materials?

Yes ____ No ____

(f) Does the agency routinely use NBS-SRM or CRM materials? Yes ___ No ___
For audits only? ____ For calibrations only? ____ For both? ____ For neither, secondary standards are employed ____.

(g) Please complete the following table to summarize auditing method for CO, NO2, O2, O3 analyzers, and High-Volume Samplers.

Pollutants		Audit Method	Audit Standard
CO			
O3			
NO2	(continuous)		
SO2			
NO2	(bubblers)		
SO2			
PM$_{10}$			
TSP			

(h) Are SRM or CRM materials used to establish traceability of calibration and zero/span check materials provided to field operations personnel?

Yes ____ No ____

(i) Specifically for gaseous standards, how is the traceability of audit system standard materials established? Are they:

purchased certified by the vendor? ________________________________

certified by the QA support laboratory which is part of this agency?

____

Other? (Please comment briefly below). ____________________________

____

____

(j) Are all agency traceability and standardization methods used documented?

Yes ____ No ____ Indicate document where such method can be found.

____

____

(k) Do the traceability and standardization methods conform with the guidance of Section 2.0.7 Vol. II of the Handbook for Air Pollution Measurement Systems?

For permeation devices? Yes ____ No ____

For cylinder gases? Yes ____ No ____

(l) Does the agency have identifiable auditing equipment (specifically intended for sole use) for audits?

Yes ____ No ____ If yes, provide specific identification

____

____

(m) How often is auditing equipment certified for accuracy against standards and equipment of higher-authority?

____

____

(n) As a result of the audit equipment checks performed, have pass/fail (acceptance criteria) been decided for this equipment? Indicate what these criteria are with respect to each pollutant. Where are such criteria documented?

Pollutant	Criteria

3. NATIONAL PERFORMANCE AUDIT PROGRAM (NPAP) AND ADDITIONAL AUDITS

(a) Identify the individual with primary responsibility for the required participation in the National Performance Audit Program.

For gaseous materials? (name, title) ______________________________

____

For laboratory materials? (name, title) ____________________________

____

(b) Does the agency currently have in place any contracts or similar agreements either with another agency or outside contractor to perform any of the audits required by 40 CFR 58?

Yes ____ No ____ Comment ______________________________________

____

____

____

If yes, has the agency included QA requirements with this agreement?
Yes ____ No ____

Is the agency adequately familiar with their QA program?
Yes ____ No ____

(c) Date last systems audit was conducted? ________________

By whom? ____________________

(d) Please complete the table below

Parameter Audited	Date of Last NPAP
SO2 (Continuous)	
CO	
Pb	
ReF Device	
SO2 (bubbler)	
NO2 (bubbler)	

(e) Does the agency participate in the National Performance Audit Program (NPAP) as required under 40 CFR 58 Appendix A? Yes ____ No ____

If no, why not? Summarize below.

4. DOCUMENTATION AND DATA PROCESSING REVIEW

(a) Does the agency periodically review its record-keeping activities?

Yes ____ No ____

Please list below areas routinely covered by this review, the date of the last review, and changes made a a direct result of the review.

Area/Function	Date of Review	Changes?	Discuss Changes
____	____	Y/N	____
____	____	Y/N	____
____	____	Y/N	____
____	____	Y/N	____
____	____	Y/N	____

(b) Are data audits (specific re-reductions of stripcharts or similar activities) routinely performed for criteria pollutant data reported by the agency? Yes ____ No ____

If no, please explain. ____

(c) Are procedures for such data audits documented? Yes ____ No ____

(d) Are they consistent with the recommendations of Sections 2.3-2.9 of Vol. II of the QA Handbook for Air Pollution Measurement Systems?

Yes ____ No ____ If no, why not? ______________________________

____

(e) What is the frequency and level (as a percentage of data processed) of these audits?

Poll.	Audit Freq.	Period of Data Audited	% of Data Rechecked

(f) Identify the Criteria for acceptable/non-acceptable result from a data processing audit for each pollutant, as appropriate.

Pollutant	Acceptance Criteria	Data Concentration Level

(g) Are procedures documented and implemented for corrective actions based on results of data audits which fall outside the established limits?
Yes ____ No ____

If yes, where are such corrective action procedures documented?

____

____

5. CORRECTIVE ACTION SYSTEM

(a) Does the agency have a comprehensive Corrective Action program in place and operational? Yes ____ No ____

(b) Have the procedures been documented? Yes ____ No ____ As a part of the agency QA Plan? Yes ____ No ____ As a separate Standard Operating Procedure? Yes ____ No ____ Briefly describe it or attach a copy.

____

____

____

(c) How is responsibility for implementing corrective actions on the basis of audits, calibration problems, zero/span checks, etc. assigned? Briefly discuss.

____

____

____

____

(d) How does the agency follow-up on implemented corrective actions?

____

____

____

____

(e) Briefly describe two (2) recent examples of the ways in which the above corrective action system was employed to remove a problem area with

I. Audit Results: ______________________________

____

____

____

____

____

II. Data Management: ______________________________

____

____

____

____

____

6. AUDIT RESULT ACCEPTANCE CRITERIA

(a) Has the agency established and has it documented criteria to define agency-acceptable audit results? Yes ____ No ____

Please complete the table below with the pollutant, monitor and acceptance criteria.

Pollutant		Audit Result Acceptance Criteria
CO		
O_3		
NO_2	(continuous)	
SO_2		
NO_2	(bubblers)	
SO_2		
PM_{10}		
TSP		

(b) Were these audit criteria based on, or derived from, the guidance found in Vol. II of the QA Handbook for Air Pollution Measurement system, Section 2.0.12? Yes ____ No ____

If no, please explain. ________________________________

____

If yes, please explain any changes or assumptions made in the derivation.

____

____

(c) What corrective action may be taken if criteria are exceeded? If possible, indicate two examples of corrective actions taken within the period since the previous systems audit which are based directly on the criteria discussed above?

Corrective Action #1 ____

____

____

Corrective Action #2 ____

____

____

(d) As a goal, the 95 percent probability limits for precision (all pollutants) and TSP and PM_{10} accuracy should be less than ±15 percent. At 95 percent probability limits, the accuracy for all other pollutants should be less than ±20 percent.* Using a short narrative and a summary table, compare the reporting organization's performance against these goals over the last year. Explain any deviations.

NOTE: Precision and accuracy are based on reporting organizations; therefore this question concerns the reporting organizations that are the responsibility of the agency. A copy of a computer printout has been provided which contains the precision and accuracy data submitted to EMSL for each of the agency's reporting organizations. The printout, containing at least the last four completed calendar quarters of precision and accuracy data, was obtained using the NADB program AMP240. This data should be verified using agency records. If found in error, please initiate corrections. Based on the data provided or corrections thereto, complete the tables below indicating the number of reporting organization's meeting the goal stated above for each pollutant by quarter.

(Report level 2 checks unless otherwise directed by Regional Office.)

*While the accuracy goals for all audit levels are important, the principal concerns are the audit levels that include the ambient standard or the levels just above the standard and just below the standard.

I. Precision Goals

Pollutant	# of Reporting Organization	Precision Qtr/Yr	Precision Qtr/Yr	Precision Qtr/Yr	Precision Qtr/Yr
03					
NO2					
SO2					
CO					
TSP					
PM_{10}					
Pb					

II. Accuracy Goals

Pollutant	# of Reporting Organization	Precision Qtr/Yr	Precision Qtr/Yr	Precision Qtr/Yr	Precision Qtr/Yr
03					
NO2					
SO2					
CO					
TSP					
PM_{10}					
Pb					

(e) To the extent possible, describe problems preventing the meeting of precision and accuracy goals.

11.8 Bibliography

Guideline documents for the SLAMS Air Program, arranged in descending chronological order, the most recent ones first.

Reference	Report Title
EPA-600/4-83-023 June 1983	Guideline on the Meaning and Use of Precision and Accuracy Data Required by 40 CFR Part 58 Appendices A and B
EPA-600/7-81-010 May 1981	A Procedure for Establishing Traceability of Gas Mixtures to Certified National Bureau of Standards SRMs
EPA-QAMS-005/80 December 1980	Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans
EPA-600/4-80-030 June 1980	Validation of Air Monitoring Data
EPA-600/4-79-056 September 1979	Transfer Standards for Calibration of Air Monitoring Analyzers for Ozone
EPA-600/4-79-057 September 1979	Technical Asssitance Document for the Calibration of Ambient Ozone Monitors
EPA-600/4-79-019 March 1979	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA-450/4-79-007 February 1979	Guidance for Selecting TSP Episode Monitoring Methods
EPA-600/4-78-047 August 1978	Investigation of Flow Rate Calibration Procedures Associated with the High Volume Method for Determination of Suspended Particulates
EPA-450/2-78-037 July 1978	Screening Procedures for Ambient Air Quality Data
EPA-450/3-78-013 April 1978	Site Selection for the Monitoring of Photochemical Air Pollutants
EPA-450/3-77-018 December 1977	Selecting Sites for Monitoring Total Suspended Particulates

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CORRECTIVE ACTION IMPLEMENTATION REQUEST (CAIR)

Reporting Organization ______________________________

State or Local Agency ______________________________

Deficiency Noted:

Agreed-upon Corrective Action:

Schedule for Corrective Action Implementation:

Signed ____________________ Director ________________ Date

____________________ QA Officer ______________ Date

____________________ Audit Team Member __________ Date

Corrective Action Implementation Report:

____

Signed ____________________ Director ________________ Date

Signed ____________________ QA Officer ______________ Date

Chapter 6

Motor Vehicle Emissions Inspection Program Audit Guidelines

FY 1988-1989

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Guidelines for Auditing Motor Vehicles

Emissions Inspection Programs

FY1988-1989

1.0 INTRODUCTION AND PURPOSE

Motor vehicle emissions inspection/maintenance (I/M) programs are currently required in over 30 States or localities under Part D of the Clean Air Act. At present, I/M programs are operating in 59 urban areas in 31 States across the country affecting over 45 million vehicles. All but a few of these programs measure the tailpipe emissions concentrations of subject vehicles; many of them also inspect for evidence of emission control system tampering or misfueling. EPA has a regulatory responsibility to review these programs in each State for overall effectiveness and conformance to EPA policy and State Implementation Plan (SIP) commitments.

EPA's auditing of I/M programs is accomplished through routine monitoring of program operating data, periodic on-site program audits (or program evaluations), and targeted follow-up audits. The primary purpose of this report is to present I/M auditing guidelines for use by EPA personnel involved in these monitoring and evaluation efforts. Both emissions inspections and tampering/misfueling inspection elements are covered by the guidelines. Since all but four of the operating I/M programs have undergone full initial on-site audits, most of EPA's future evaluative efforts will emphasize monitoring of programs with operating problems. The audit guidelines are designed to ensure that EPA's audits of the I/M programs are comprehensive and consistent.

The primary purpose of EPA I/M auditing is to ensure that each State or locality is effectively implementing and enforcing its I/M program in a manner consistent with its SIP. As a result of the audit, both EPA and the State or local agencies involved will be able to determine what, if any, program improvements may be required to allow SIP goals and commitments to be met. EPA reviews the design and operation of I/M programs across the country, and has the opportunity to observe the strengths and weaknesses of the various programs. As a result, EPA may be able to suggest administrative or program modifications which would increase program effectiveness.

2.0 OVERVIEW OF THE I/M AUDIT

EPA must determine whether a program is being managed effectively to produce the desired emissions reductions, determine whether adequate steps are being taken to enforce the program, and ensure that vehicles are being inspected properly and effectively repaired. Each approved SIP commits to a certain level of I/M program effectiveness which meets or exceeds EPA's minimum emission reduction requirement. A number of SIP design factors affect the ability of a program to be effective in reducing emissions including: vehicle coverage, model year coverage, geographic coverage, stringency, frequency of inspections, waivers, enforcement, and others. Apparent deviations from the SIP will be investigated and documented through monitoring of operating data and on-site program visits.

2.1 Monitoring Program Effectiveness

The first years of experience auditing I/M programs have lead EPA to develop indicators of program effectiveness that can be used to monitor progress in achieving and maintaining operating goals. These indicators of program effectiveness are:

1) Compliance Rate - The percentage of vehicles subject to the I/M program that complete the test process.

2) Initial Failure Rate - The percentage of vehicles failing the initial test.

3) Retest Failure Rate - The percentage of vehicles failing one or more retests.

4) Waiver Rate - The percentage of vehicles that fail the initial test and receive a waiver.

5) Emission Reductions From Waived Vehicles - The mean initial emission scores for vehicles receiving a waiver minus the final test mean emission scores for these vehicles.

6) Repair Effectiveness Measure - Mean idle emission test scores for vehicles failing the initial test minus the final test mean idle emissions scores of these vehicles.

7) Overall Emission Reduction - An analysis that incorporates compliance rate, initial failure rate, waiver rate, and adjusts the design emission reductions to reflect actual program performance. A detailed description of this analysis is included in Appendix A.

Tracking these seven indicators on a routine basis allows early identification of program operating problems. In order to accomplish this tracking, I/M programs will need to provide EPA with the following data on a semi-annual basis:

1) Number of vehicles required to be inspected.
2) Number of vehicles receiving initial inspection by model year.
3) Number of vehicles failing the initial emission test by model year.
4) Number of vehicles failing each retest by model year.
5) Number of vehicles passing, failing, or not equipped for each tampering component for which SIP credit is claimed by model year.
6) Number of vehicles receiving waivers by model year.
7) Mean scores for CO and HC of passing, failing, and waived vehicles by initial test and final retest.
8) Number and percentage of analyzers malfunctioning (out of calibration, leaks, etc.) during audits.

In addition, decentralized programs must provide the following summary statistics on a semi-annual basis:

9) Number of vehicles inspected by station and by model year.
10) Number of vehicles failing the initial emission test by station and model year.
11) Number of vehicles failing the retest by station and by model year.
12) Number of initially failed vehicles receiving waivers by station and by model year.
13) Number of vehicles passing, failing, or not equipped for each tampering component for which SIP credit is claimed by model year and station.
14) Number of station audits conducted.
15) Number and types of covert surveillance activities conducted.
16) Number of facility licenses outstanding at end of reporting period.
17) ID numbers of stations warned, suspended, or revoked for violation of rules by type of violation.

Headquarters staff is responsible for analyzing the I/M operating data and identifying potential operating problems. Regional offices are responsible for obtaining semi-annual reports and planning and implementing appropriate actions (e.g., assessing problems through an on-site visit; requesting further information; calling for special studies, surveys or corrective action).

2.2 Initial I/M Audits

The initial I/M audit is conducted after a program has been in operation for at least one year. In addition to reviewing program operating statistics, all design parameters of the I/M program which affect the program's ability to meet legal requirements of the SIP and the Clean Air Act should be reviewed. Comparing the design of the program in the SIP to its actual implementation allows EPA to evaluate whether applicable laws, regulations, and procedures are being administered properly and are resulting in expected emissions reductions. Program parameters include:

1) Inspection test procedures,
2) Emission standards (cutpoints),.
3) Inspection station licensing requirements,
4) Analyzer specifications,
5) Maintenance/calibration requirements,
6) Quality control procedures,
7) Audit/surveillance procedures,
8) Internal control systems (quality assurance),
9) Enforcement procedures,
10) Vehicle coverage considerations,
11) Waiver procedures,
12) Consumer assistance and protection, and
13) Mechanics training.
14) Data recording and analysis procedures.

Detailed descriptions of each I/M design element are provided in Appendix B. As well as affecting overall program operations, many of these design parameters influence the availability of the emissions performance warranty in a particular State or locality.

It is critical during an initial audit to determine whether the various elements of the I/M program as designed and approved in the SIP, are actually being carried out. At a minimum, the initial evaluation must determine:

1) Whether the program is being adequately enforced (i.e., whether all subject vehicles are being inspected).
2) Whether inspection standards and vehicle coverage are adequate.
3) Whether vehicles are being inspected properly (i.e., according to established procedures, using the proper cutpoints, etc.).
4) Whether vehicles identified for repair are being repaired effectively.

2.3 Follow-up Audits

The purpose of a follow-up audit is to assess progress made in correcting operating problems identified during the initial program audit or through monitoring of program indicators. The form of the follow-up audit will depend on the type of problems identified for correction. The follow-up audit may include a site visit, analysis of reported data, review of amended procedures and regulations, or other activities. EPA headquarters staff and Regional Staff will determine the form and substance of follow-up audits and audit documentation (reports) on a case by case basis.

2.4 Corrective Action

Design flaws or implementation deficiencies that are serious enough to cause emission reduction benefits to fall below the minimum requirements will trigger a formal EPA process to bring about resolution of the problems. Once an emission reduction deficiency is identified, the Regional Office will notify the Governor of the need for a corrective plan. The plan should specify the steps the State plans to take to correct the deficiencies. To be acceptable, the plan should include an expeditious implementation schedule, contain specific measures to address the problems causing the shortfall, and have a reasonable chance for success. The Regional Offices will have the lead in obtaining corrections from the States and localities. The Office of Mobile Sources will provide technical and policy support. Failure to comply with either the request for corrective action or failure to resolve operating problems could result in initiation of sanctions available under the Clean Air Act.

3.0 INITIAL PROGRAM AUDIT PROCESS

The initial program audit is comprised of four basic elements: advance preparation, audit visit, audit report, and follow-up actions.

3.1 Advance Preparation

Preparation for the audit allows the auditors to familiarize themselves with the design and operations of the program under review and to identify those particular aspects of the program which may need special emphasis during the audit visit. Proper preparation will allow the auditors to use their time more efficiently and will reduce the disruption of the I/M program during the audit.

The auditors assigned to perform the audit must collectively possess as much knowledge as possible about the operations of I/M programs in general and about the specific details of the program under review. The goal of audit preparation is to determine the potential strengths and weaknesses of the programs so that the audit can be focused and efficiently conducted.

3.1.1 Documentation Assembly

The first step in preparing for the audit visit includes acquisition and assembly of current versions of the basic documents associated with the program. This includes EPA documents such as SIPs, letters and memoranda, and State documents such as legislation, rules and procedures manuals. The types of documents that the Regional Office needs to obtain from the State for this phase of the audit include:

1) Rules and regulations.
2) Analyzer specifications.
3) Quality control procedures and forms.
4) Quality assurance procedures and forms.
5) Test forms, waiver forms, repair forms.
6) Enforcement procedures.
7) Mechanic and inspector training materials.
8) Inspector and station licensing requirements.
9) Current contracts.
10) Public awareness materials.

Copies of these items will be needed for each EPA office involved in the audit.

Other sources of information in preparing for an audit visit may include: periodic operating reports produced for EPA, documentation of previous audits or investigations, correspondence, formal reports to agency heads, governors, or legislatures. Correspondence to and from program officials, citizens, and other interested parties should be reviewed to determine what, if any, issues may may have already been identified or addressed. It is particularly important that auditors try to be aware of any special sensitivities in a specific State or locality revealed in previous correspondence.

3.1.2 Review Operating Data

The next step in audit preparation is to review the program operating data that should be provided to the agency on a semi-annual basis. OMS will conduct an analysis of the emission reduction benefits from the program. This will allow the auditors to identify in advance areas of concern on which the audit should be focused.

3.1.3 Notice to Program Officials

After audit preparation has progressed to the point where an audit visit can be scheduled, the EPA Regional Office should send a formal written notice of the audit to the appropriate State and local officials. The written notice should allow ample lead time (about 60 days should be sufficient in most cases) to schedule a mutually convenient time for the site visit and to complete pre-visit preparations. The formal notice should also specify, whenever possible, those individuals who will comprise EPA's audit team and what State/local organizations should be represented. Finally, the formal notice should identify any special issues raised during the advance preparation.

When agencies in addition to the air planning agency must be included in the audit, the Regional Office will determine how to secure their involvement and cooperation, and will notify each of the upcoming site visits. In addition, the Regional Office will provide notice to the Office of Mobile Sources of scheduled audit visits at least 60 days in advance.

3.1.4 Program Questionnaire

To facilitate audit preparation, an I/M program questionnaire has been developed (see Appendix C). This document summarizes relevant design and operating aspects of the I/M program. The questionnaire addresses design aspects of the program and actual operating experience. It is recommended that the Regional Office send a blank copy of the questionnaire for the State or local officials to complete in advance of the site visit along with the formal notification. Once the questionnaire has been completed and submitted to EPA, a conference call could be held with Regional Office staff, OMS staff and the State or local agency to discuss any answers that require further discussion. This process can be continued or completed at the entrance interview.

3.1.5 Conference Call

The conference call should take place about two weeks before the audit. The purpose of the call is to make final arrangements, assure understanding of plans, resolve any outstanding questions and obtain any additional information. In some cases, EPA may request certain information not covered by the questionnaire or other information submitted for review in order to complete audit preparations.

3.2 Site Visit

The site visit is for the purpose of investigating and documenting whether the program is being properly administered and enforced, according to established laws, regulations, and procedural requirements in the SIP.

Field observations may be necessary to determine whether:

1. Vehicles are being tested properly and the results are being reported correctly.
2. Emission standards are being properly applied.
3. Licensing requirements are being met.
4. Analyzers are being calibrated and maintained.
5. Quality control procedures are being followed.
6. Inspection and other records are being kept properly.
7. Data analysis is being used to manage the program.
8. Inspection stations are receiving adequate surveillance and supervision.
9. Repair waivers are being processed properly.
10. Owners of non-complying vehicles are being identified and prosecuted.

11. Failed vehicles are being repaired effectively.
12. Consumer assistance and protection provisions are being administered properly.
13. Mechanics training is being conducted appropriately.
14. Repair information (manuals), newsletters and brochures are available for owners and mechanics.
15. Complaint mechanisms are available for consumers.

It is also a means for identifying causes of and solutions to operating problems indicated either by data analysis or review of materials submitted prior to the site visit. The purpose of the audit visit is to verify information already available and to gather new information as needed to satisfy the objectives of the audit. One objective should always be to identify those areas where EPA can provide assistance to strengthen I/M programs. Sometimes such assistance may involve specific aid to a particular State, and at other times it may involve more general assistance aimed at resolving an overall technical issue.

The audit visit should be adequately planned to ensure that all needed activities are conducted within the time constraints involved. Generally, a two- or three-person EPA audit team should be able to complete the on-site visit in three or four days, at times working independently, depending on the size and complexity of the program. These days need not be consecutive, and the Regional Office may find it desirable to separate special surveys, records review, inspection station visits, and interviews with officials. The audit must be planned and coordinated with State and local agencies in order to minimize the level of intrusion and disruption of normal program activities.

In States with I/M programs operating in multiple urbanized areas, it will usually be necessary to visit several I/M areas. This is because each urbanized area will usually have a separate manager, potentially different enforcement agency practices, and potentially different repair industry competence and enthusiasm for the I/M program. Careful planning will again be necessary to schedule multiple city visits, maximize the audit team's efficiency, and minimize the impact on State or local operations. It may also be possible to utilize contractor or other third-party support for certain types of audit activities such as roadside surveys, if acceptable to State or local officials.

A formal record of the auditors' work should be compiled for the audit file. Each auditor should keep detailed notes on persons contacted or interviewed and information received, its source, and when received. Sample forms for such notes are included in Appendix F.

Auditors should be alert to situations which do not appear to be in keeping with program procedures or regulations in the SIP; such situations should be investigated during the audit visit to the extent possible. Auditors should also be alert to situations that could be indicative of fraud, abuse, or illegal acts; these situations may be reported to program officials rather than being investigated during the audit. Finally, auditors should be alert to signs that their visit may have resulted in observed behavior not typical of normal program operations. Auditors should select specific facilities and personnel for observation without advance notification to the State or local agencies. This is often done in conjunction with the entrance interview during which the audit team chooses the stations to be visited in cooperation with program officials.

An important part of the audit visit is an evaluation of the internal control system applicable to the program, organization(s), and activities under review. Each State or locality operating an I/M program should have an established methodology and capability for evaluating program operations in order to assess program results. Through this system of administrative controls, the State or locality should continuously or periodically compare actual program operations to intended design and overall goals. The emphasis in this system should be to identify problems and to take corrective action. Internal audits are usually an integral part of the internal control system.

In the following sections, specific activities of the I/M audit visit are listed and discussed. A more detailed discussion of these activities is found in Appendix D. The purpose of each activity is to collect information related to one or more of the audit topics listed in Section 2.0 and discussed in detail in Appendix B.

3.2.1 Interviews

The following State or local officials or their designees must be interviewed during the audit visit: the air planning agency officials with responsibility for mobile sources, the I/M manager (whether employed by the air agency or another agency), and operations personnel with close knowledge of current practices and experiences in the areas of enforcement, quality control, repair waivers, data analysis, and mechanic training. The I/M manager may be able to discuss all of these areas, or additional staff may need to be included.

3.2.1.1 Entrance Interview

The starting point for the audit visit should be an initial meeting with State and local officials involved in air quality planning for mobile sources and, if different, officials involved in program. The agenda for this interview should be finalized at the pre-visit conference call and should be based on the questionnaire and the findings of any on-site activities which have preceded the site visit. In addition to discussions of program design and organization, this meeting should focus on any problem areas in the program which State/local officials have already identified and their plans for resolving them. Also any planned program modifications, improvements, and expansions should be discussed. Finally, the interview should answer any outstanding questions posed prior to the site visit.

Discussions with I/M manager and other program operations personnel should focus on operational aspects of the program including: compliance rates; failure rates; waiver rates; repair costs; mechanic training efforts; complaints (types, how resolved, etc.); internal control efforts (surveillance, results of station audits, data analyses, investigations using unmarked vehicles, etc.); and enforcement aspects (procedures, results, etc.). Again known problems and planned resolutions should be discussed. In some cases, EPA may request the State or local officials to make a formal presentation, or have any contractors make a presentation, at the entrance interview on a particular topic or on the program as a whole.

3.2.1.2 Other Interviews

In addition to interviewing agency officials with direct involvement in the I/M program, it may be desirable to interview non-program individuals with knowledge of the I/M program and differing perspectives on its operation. Useful interviews can be held with contractor representatives, auto club officials, service industry association officials, auto dealers association officials, consumer agency officials, instructors of mechanics, and persons in other related roles. These people can be interviewed by telephone or at a time other than the site visit.

3.2.2 Records Review

Another important phase of the site visit is the review of records relevant to the I/M program. These records include inspection records, waiver records, audit records, and covert surveillance records. To the extent possible and practical, copies of these records should be obtained for careful review before or after the on-site visit.

Inspection records should be reviewed to determine what data are collected and how the data are used. When inspection records are kept manually, it is important to review samples of the records for completeness, legibility, accuracy of inspection standards, reasonableness of test scores, and accuracy of the pass/fail decision.

Waiver records should be reviewed to determine that waivers are being processed in compliance with waiver criteria. The review should also determine how many waiver applications are being received, approved, and denied; the extent to which waivers are denied because of inappropriateness of repairs; and, the extent to which waiver transactions are tracked by repair facility (where appropriate).

Audit records should be reviewed to determine that thorough audits are being conducted and that problems are resolved when found. The review should determine whether the audit frequency and the procedures used are in accordance with SIP commitments. This may include reviewing records kept by station auditors, records kept in the stations, and/or records maintained by program management.

Covert surveillance records should be reviewed to determine the nature of surveillance efforts, the information collected, and the types of actions taken for various findings. An assessment should be made to determine:

1) If enough surveillance is being performed to reasonably identify problems.
2) The methods and standards used to gather information and determine the need for enforcement action are adequate to insure correction of operating problems.
3) The process and procedures for implementing enforcement are timely and effective and are, in fact, being applied (i.e. suspensions and revocations are occurring).

3.2.3 Inspection Station Visits

During the site visit, all types of inspection stations and other licensed facilities should be visited, including regular inspection stations, fleet stations, referee or waiver stations, reinspection stations, or any other type of station conducting initial inspections or retests. The emphasis, however, should be on the types of stations that inspect the majority of the vehicles. Depending on the type of station, any or all of the following activities may be part of the visit:

1. Conduct or observe an audit of emission analyzers, using span gas.
2. Observe exhaust emission inspections and anti-tampering inspections, as appropriate.
3. Observe waiver processing.
4. Check inspection, enforcement, calibration and audit records.
5. Interview station personnel.

It is preferable to begin each station visit by observing the normal practice of the State auditor. Appendix F includes forms for observing the State auditor and inspection station performance. Once the State auditor is finished, the EPA auditors should begin their audit. Forms are provided in Appendix F for EPA activities as well. Decentralized stations are generally required to keep inspection records and analyzer calibration records; these records should be reviewed during the station visits.

The number of station visits will vary according to the type and size of the I/M program under evaluation. In the case of a centralized program with only a few (less than five) inspection stations, it may be possible to visit all or most of the facilities. In larger centralized programs and in decentralized programs, only a fraction of the stations can be visited. The following guidelines should be used in deciding how many and which stations to visit.

In centralized programs:

1. Visit at least three stations; more should be visited if inconsistencies are found, or when the program has an extremely large number of centralized facilities.
2. Choose stations with a high volume of inspections.
3. Choose stations that represent a reasonable cross section of types of economic strata.
4. Choose at least one station, if possible, that has a past record of possible quality control problems; i.e., low failure rates, high level of analyzer audit failures, etc. (based on records review).

In decentralized programs:

1. Visit at least 10 stations, with more depending on the time available and the size of the program.
2. Choose stations which represent a cross section of types of economic strata.
3. Choose stations which are the responsibility of different State/local agency field investigators.
4. Choose stations which represent a cross section of different types of businesses (service stations, independent garages, auto dealers, chain service centers, etc.)
5. Choose stations which represent a cross section of types/makes of analyzers.

In decentralized programs, the EPA auditors should accompany at least two State/local field auditors. The EPA auditors may choose which State/local auditors are accompanied but must be careful to get the right mix of types of stations.

3.2.4 Special Surveys

In some cases there may be a need for special surveys as part of the audit visit (or at some other time). In areas that use sticker enforcement, a sticker compliance survey must be conducted. Such a survey involves visiting a number of parking lots and walking along streets of parked cars to observe a sample of vehicles and collect data on sticker compliance or noncompliance.

Other potentially useful data gathering surveys are emissions testing surveys and tampering surveys. Such surveys involve collecting emissions short test data and/or tampering data on a representative group of local vehicles. Tampering and emission surveys are typically conducted by EPA in cooperation with State and local officials as part of a mandatory roadside pullover program. OMS is interested in working with State and local officials to design and conduct such surveys. A description of the procedures currently used in OMS tampering surveys is included in Appendix E.

3.2.5 Exit Meeting

The exit meeting is usually the last scheduled activity during the site visit. The purpose of the exit interview is to inform agency officials of the preliminary findings of the audit. The audit team should meet prior to the exit interview to discuss the observations, opinions, and conclusions of individual auditors. The limited time available during the audit visit does not, however, allow all information and data to be fully evaluated prior to the exit interview. In some cases, aspects of the program may necessitate computer modeling analyses before a final evaluation can be made.

Despite limitations, the exit interview should be used to convey as much information as possible to program officials. At a minimum, they should be briefed on the activities that were conducted during the audit visit and on any follow-up activities that will be needed to supplement the audit visit. If definite problems are identified during the audit, they should be discussed during the exit interview. Discussion should also cover suspected but unverified problems, and how they will be further evaluated during follow-up activities. State and local officials should also be given a projection of when the draft audit report will be submitted to the State for review.

3.3 Audit Report

The EPA Regional Office will prepare an audit report which will document the findings of the audit, present EPA conclusions, and suggest improvements. The Office of Mobile Sources will be given an opportunity to review and comment on the Region's draft audit report prior to it being sent to the State and local agencies for review. All official comments received from the State or local agencies should be appended to the report.

The audit report must properly and objectively reflect the findings of the audit, both positive and negative. The audit report should specifically:

1. Summarize program operating data.
2. Identify the strengths of the program.
3. Identify SIP deficiencies for which program improvements must be implemented.
4. Make recommendations for correction of these deficiencies.
5. Identify aspects of the program which need further study, may be potential problems or where EPA can suggest minor modifications which would improve program effectiveness or efficiency.

The audits should be of sufficient scope and adequately documented and reported in such a way that the record will adequately support EPA follow-up action in the form of a call for SIP revisions or a finding of non-implementation of the SIP, should that be necessary. In some cases, follow-up may be necessary to collect data to support such actions. A checklist is provided in Appendix G for completing the I/M audit.

4.0 FOLLOW-UP AUDIT PROCESS

The follow-up audit process, while similar to the initial audit process, has by necessity a flexible structure. The activities pursued in a follow-up audit should be designed to address the particular problems identified in previous audits or problems that have arisen since. In particular, the audit should determine what progress the program has made in implementing recommendations and correcting problems. The following guidelines will attempt to cover the major problem groups often encountered in I/M programs but each particular program may require some unique attention.

4.1. Follow-up Audit Activities

Follow-up audit activities may include any or all of the activities required in the initial audit but generally will be narrower in scope. There are three basic activities which may be involved in a follow-up audit: site visits, station visits and review and analysis.

4.1.1 Site Visits

Site visits are needed when the program has instituted significant changes that require on-site verification and assessment. Specific activities could include station visits, record review, covert surveillance activities, sticker surveys, and the like.

4.1.2 Station Visits

Station visits are needed when improper testing, quality control or quality assurance problems exist. If problems exist with waiver processing by stations, this too might require station visits.

4.1.3 Review and Analysis

Site and station visits can be omitted in many cases, especially when the problems relate to data processing and reporting. Also, review of changes to rules or procedures can generally be completed without a site visit. Conference calls and correspondence can be used to provide the detailed information needed to satisfy the follow-up audit goals.

4.2 Follow-up Audit Reports

The report of activities and findings from a follow-up audit should be tailored to the specific situation. There is no need to address all of the elements addressed in an initial audit, only those that were the subject of the follow-up audit.

4.3 Corrective Action

As with the initial audit, design flaws or implementation deficiencies that are serious enough to cause emission reduction benefits to fall below the minimum requirements, will trigger a formal EPA process to bring about a call for a corrective plan as described in Section 2.4.

APPENDIX A

METHOD FOR DETERMINING REQUIRED EMISSION REDUCTION COMPLIANCE IN OPERATING I/M PROGRAMS

APPENDIX A WILL NOT BE USED DURING THIS AUDIT CYCLE.

APPENDIX B

DESCRIPTIONS OF I/M PROGRAM ELEMENTS

1. Test Procedures
2. Emission Standards
3. Inspection Station Licensing Requirements
4. Analyzer Specifications
5. Quality Control Procedures
6. Quality Assurance
7. Enforcement Procedures
8. Vehicle Coverage
9. Waiver Procedures
10. Consumer Assistance and Protection
11. Mechanics Training

DESCRIPTIONS OF I/M PROGRAM ELEMENTS

1. Test Procedures

There are two basic types of tests conducted in I/M programs: tailpipe emission tests and a check for the presence and/or function of emission control devices. The goal of the emission test is to provide a uniform, reliable, simple test to identify high emitters. The goal of the emission control device check is to identify vehicles with missing or modified emission control devices. Retests are required to ensure that failed vehicles receive sufficient maintenance to reduce emissions or, proper repairs or replacement of modified or missing emission control components. Emission test procedures vary from state to state but usually consist of measurement of emissions at idle and in some programs at 2500 rpm, as well. In many programs different tests are conducted on different model years of vehicles, especially in the case of checks for emission control components.

An additional variation among State/local programs is the degree of automation involved with the test procedure. Some programs have a fully automated procedure while others have a completely manual system.

Another important element of the test procedure is the adherence to the requirements of 40 CFR, Part 85, Subpart W. This section of the Code of Federal Regulations specifies the requirments for the emission performance warranty provided in §207(b) of the Clean Air Act Amendments of 1977. This warranty generally applies to 1981 and newer (1982 and newer at high altitude) model year light-duty vehicles and light-duty trucks and has specific requirements for test procedures which must be followed, in order for motorists to be eligible for warranty coverage.

2. Emission Standards

Emission standards are used to determine which vehicles pass or fail the emission test. The State Implementation Plan for each program includes a target design stringency, which is the percentage of pre-1981 vehicles failing the test in the first year of the program. Evaluation of standards should focus on overall failure rate and the degree to which SIP commitments are being achieved.

3. Inspection Station Licensing Requirements

In order to achieve uniform and accurate testing, it is necessary to assure that all inspections are conducted by properly trained and equipped inspectors and to provide a mechanism for accountability of inspection facilities. In centralized programs, both contractor-run and government-run, where inspectors are under more or less direct control, there are only be employee training requirements rather than licensing requirements. In decentralized programs, and in fleet stations in centralized programs, EPA policy requires that there be licensing requirements which ensure that:

1. All stations employ trained inspectors.
2. All stations have approved analyzers.
3. All stations keep necessary records on inspections, calibrations, and maintenance and agree to make these records available to the State or local agency.

4. Analyzer Specifications

Each program must adopt and enforce equipment requirements which will provide for accurate and consistent emission measurements. Equipment specifications cover the basic technical requirements of the analyzer (i.e., accuracy, repeatability, drift, etc.) as well as other basic requirements (e.g., throughput capabilities, software requirements, durability, etc.).

Centralized I/M programs typically use analyzers that are computer-controlled and feature automatic data collection and decision-making. These systems usually have elaborate maintenance and calibration networks associated with them. As one would expect, decentralized I/M programs have the most variety with respect to analyzer requirements. Some programs require computerized analyzers, and others require only manual analyzers. Some programs have established a list of approved analyzers, while others accept any analyzer certified by the manufacturer to meet certain specifications.

The emission performance warranty regulations include requirements for analyzer accuracy and quality control. These requirements must be met in order for motorists involved in I/M programs to be eligible for warranty repairs.

Regardless of the type of analyzer or the type of program, appropriate maintenance and calibration procedures are needed to ensure that the analyzers yield accurate and repeatable measurements. These requirements involve the introduction of span gas to check and adjust calibration and check for leaks (some programs use vacuum decay instead), periodic cleaning of tape drives and other analyzer parts, and replacement of filters and other consumeables.

5. Quality Control Procedures

Quality control procedures should be prescribed to ensure that analyzers are calibrated and maintained, that inspections are conducted properly, and that inspection and calibration records are completed properly. In computerized systems, some of these checks can be automated.

A comprehensive quality control system should address:

1. Analyzers
   - Periodic calibration checks
   - Periodic leak checks
   - Regular preventive maintenance
   - Accurately named calibration gases

2. Inspections
   - Assurance that analyzer is ready for testing (warmed up, zeroed, and spanned)
   - Assurance that vehicle is warmed up
   - Assurance that there is no excessive exhaust system leakage
   - Assurance that proper probe insertion depth is achieved

3. Pass/Fail Determinations
   - Proper vehicle and cutpoint identification
   - Safeguards to prevent mistake, fraud or abuse

6. Quality Assurance

Quality assurance procedures are necessary to assure that prescribed regulations and procedures are followed and that the program is achieving its purpose. The internal control system is totally dependent on data to serve as feedback on how well the program and parts thereof are working. Therefore, the first requirement of internal control is to have an adequate and functioning data collection system. To have maximum benefit, data analysis must be accurate, reliable, complete, and timely. Data analyses should be capable of identifying the level of noncompliance among vehicle owners, the failure rate among inspected vehicles of different age groups (initial inspections separately from retests), the waiver rates, and the quality of repairs (through comparison of initial and retest emissions levels of failed vehicles). It is highly desirable that failure rates and waiver rates be calculated and periodically reviewed at the level of the individual inspection station or repair facility.

An integral part of the internal control system is the auditing of inspection facilities. These audits should focus on analyzer calibration and leak checks as well as record checks, especially when manual records are kept. In decentralized programs, investigations with unmarked vehicles set to fail the emission and/or tampering test are essential for monitoring inspector performance.

In those programs which rely on windshield stickers or certificates of compliance for enforcement, an accountability system is needed. Each inspector or inspection station should be required to show that the number of used stickers or certificates corresponds to the number of inspection passes for the period in question. This applies to both centralized and decentralized programs, since improper diversion of stickers or certificates is possible in both.

Another integral element of internal control is corrective action, or at least the means for corrective action. In some cases, this would involve penalties for infractions by inspection stations or individual inspectors. In other cases, corrective action might involve making an administrative change in the way records are kept or a change in the forms themselves. The ultimate test of internal control is whether problems can be identified and resolved.

7. Enforcement Procedures

The goal is to assure 100% participation of subject vehicles in the I/M program. There are three systems of enforcement currently used in I/M programs (some areas use a combination of these):

1. Registration denial systems.

2. Sticker based systems.

3. Registration data link systems.

Registration denial systems have historically provided the most effective and efficient means to enforce I/M requirements. In this system, vehicle registration is denied unless a vehicle has complied with the I/M requirement. Existing penalties for operating an unregistered vehicle serve to deter noncompliance, and the State or locality has an incentive (recovery of lost registration revenue) for enforcing compliance.

Sticker enforcement systems are another widely used enforcement method. In this system, vehicles are issued a window sticker as evidence of compliance. Vehicles with expired stickers or without stickers are subject to citation by police followed by some sort of penalty. Sticker enforcement programs often suffer from a lack of police priority and the ability to readily distinguish subject vehicles (especially in regionalized programs).

The registration data link system is a system used by several regionalized programs. In the data-link system, vehicles are identified and scheduled for inspection on the basis of registration data. Inspection data is then reviewed by comparing the list of vehicles scheduled for inspection in a particular period to the list of vehicles actually inspected and passed. Through this comparison, non-complying vehicles and their owners can be identified for enforcement action. The chief drawbacks to this system are the lag time in data analysis and the level of resources which must be devoted to establish the data link, operate it, and pursue prosecution of non-complying owners.

8. Vehicle Coverage

This design area covers those factors which affect the fraction of total vehicles being inspected in the I/M program. These factors include: 1) geographic coverage area, 2) weight class or use exemptions, 3) exemptions related to fuel type, and 4) model year exemptions.

Vehicle coverage factors should be chosen such that all or most of the vehicles that operate in the non-attainment area would be subject to program requirements. The geographic area should include the commuting area for the urbanized area(s) in question. Similarly, weight class and use exemptions can be set to cover the majority of gasoline. Most I/M programs include vehicles up to 8500 pounds GVW, which covers light-duty vehicles and light-duty trucks, both of which are used almost exclusively for personal transportation. Many programs require inspections for higher weight class vehicles.

Model year coverage is another potential area for affecting program effectiveness and the distribution of the program's impact. Many I/M programs inspect all vehicles or all 1968 and newer model years. Other programs limit coverage to fewer model years. Some programs vary coverage depending on the test type, often requiring emission control component checks on fewer model years than the emission test.

One important consideration when reviewing all exemptions is whether there are loopholes in the way they are administered. It is desirable, for instance, to have provisions to prohibit, and procedures to prevent, owners from registering their vehicles outside the I/M area. Also, where a weight limit exists, it is important to define the exact basis for the limit (gross vehicle weight rating, empty weight, or other), the way the official weight of a vehicle is determined (reference book, examination, or owner testimony), and whether evasion through misreported weight is occurring. Similarly, use exemptions and fuel type exemptions should be examined for loopholes.

9. Waiver Procedures

Many I/M programs include waiver provisions which are intended to limit the amount of expense an owner would have to incur as a result of failing the I/M test. Most I/M waivers are tied to repair cost ceilings. Repair cost ceilings between $50 and $100 are the most common, but both lower and higher limits are used in some programs. Since waived vehicles represent reductions in program effectiveness, high waiver rates can be particularly troublesome. Therefore, it is important to review the number of waivers being issued as well as the criteria for granting waivers and the procedures used in processing waivers. All SIP's were approved under the assumption that waiver rates would be low and emission reductions would not be significantly affected.

In programs without emission control component checks, criteria should be set to prevent tampered vehicles from getting waivers. All programs should ensure that owners take advantage of the emission performance warranty, if available. Procedures for processing waivers should focus on verifying that all waiver criteria have been met, including verification that all repairs claimed toward the repair ceiling were appropriate and actually done. Another desirable safeguard is to have the ability to track waiver rates by repair facility in order to be able to identify both abuses and simple lack of repair expertise.

Particular attention should be given to waiver criteria for, and waiver rates among, 1981 and newer vehicles. These vehicles are particularly susceptible to high waiver rates because the repair industry is relatively unfamiliar with them. They are becoming the majority of the fleet, and good repair practices should be encouraged before bad habits become entrenched.

10. Consumer Assistance and Protection

Other consumer assistance and protection aspects of I/M programs, in addition to waivers, include the following:

1. Referee test - This is an EPA requirement for decentralized programs but may be found in centralized programs, too.
2. Complaint handling - Procedures should be established for investigating complaints.

3. Repair information - Owners of failed vehicles should receive a brief discussion of the possible reasons for vehicle failure; this information will guide owners toward obtaining proper repair at a reasonable cost and may serve to reduce abuses by mechanics. I/M programs can also go as far as to publish repair effectiveness statistics of repair facilities.

11. Mechanics Training

The goal of mechanics training is to improve program effectiveness and enhance consumer protection by having a supply of mechanics trained in proper emission related repairs. Cost savings to the public from more efficient repairs can more than offset the cost of delivering training.

The following aspects of mechanics training are important:

1. Course curriculum - What is the course content?
2. Course distribution - How is the course delivered?
3. Course promotion - What is done to promote interest and participation by mechanics?
4. Course followup - What is done to foster continued support to trained mechanics?

Course content must address proper analyzer use and calibration, emission test procedures, procedures for detecting tampering and misfueling, basic information on the types of I/M failures, and diagnosis and repair of excessive hydrocarbon and carbon monoxide emissions. Mechanics training courses are generally offered through one or more of the following ways:

1. Community colleges, vocational/technical schools, high schools, etc.
2. Independent training agents (private individuals or firms licensed or certified to offer courses).
3. In-house training personnel.

Often the cost and geographic availability of the training have a bearing on how many mechanics participate. It must be realized that if repair cost waivers are readily available, mechanics are not forced by customer satisfaction to become competent in emission repairs. I/M programs with waiver provisions, therefore, carry a greater burden to encourage participation in training.

Training can be promoted through mailings to garages and contacts with garage associations, service station dealers associations, auto clubs and the like. A program to identify incompetent and problem mechanics should be accompanied by efforts to get these mechanics to receive training. Finally, legislation to allow only trained and certified mechanics to qualify vehicles for repair cost waivers exists in some States and should be considered by all.

Follow-up with trained mechanics can be useful to keep them interested and informed of new issues or additional training opportunities. Some ways to do this include:

1. Periodic newsletter.

2. Repair information hotline.

3. General mailings.

APPENDIX C

I/M PROGRAM AUDIT QUESTIONNAIRE

I/M AUDIT QUESTIONNAIRE

Page One

STATE	**PROGRAM**

VEHICLE COVERAGE	*Enter model year coverage for each class*		
	LDV	LDT1	LDT2
Emission Test			
Anti-Tampering Test			
Catalyst			
Fuel inlet restrictor			
Tailpipe lead check			
PCV			
Evaporative Canister			
Air Pump			
Exemptions			
Motorcycles			
Diesels			
Other fuels			
New vehicles			

Describe any exceptions or qualifications to above answers:

GEOGRAPHIC COVERAGE	*List areas & rumber of vehicles requiring testing*

INSTRUCTIONS
Page One

VEHICLE COVERAGE

This section is requesting detailed information on vehicle coverage in the program. There are three columns, one for each vehicle weight class, defined as:

LDV = light duty vehicles up to 6000 lbs. GVW
LDT1 = light duty trucks up to 6000 lbs. GVW
LDT2 = light duty trucks from 6000 to 8500 lbs. GVW

In these columns, please enter the model year ranges applicable to the emission test and each component of the tampering test. Also, indicate whether the vehicle types listed under exemptions are, in fact, exempt. Enter the model year ranges of those that are not exempt.

GEOGRAPHIC COVERAGE

This section is requesting information on the geographic locations of the program. List the major urban areas covered by the program and provide an estimate of the number of vehicles required to participate in the program. If possible, break down the estimate by urban area.

I/M AUDIT QUESTIONNAIRE

Page Two

TEST PROCEDURES *Emission Test*	YES/NO	DESCRIBE *if and when each of the items listed is used, how it is done, and any exceptions*
Electric zero/span		
HC hang-up check		
Preconditioning		
Tachometer used		
Idle test		
2500 RPM test		
Loaded test		
CO2 cutpoint		
Restart test		

Describe other emission test related features, problems or comments:

INSTRUCTIONS
Page Two

EMISSION TEST PROCEDURES

The intent of this section is to describe the precise nature of the emission test procedures. Enter yes in the column labeled "Yes/No" if the activity listed is used during the test procedure. Use the describe column to explain the activity further.

I/M AUDIT QUESTIONNAIRE

Page Three

TEST PROCEDURES ***Anti-tampering Test***	**YES/NO**	**DESCRIBE** *if and when each of the items listed is used, how it is done, and any exceptions*
Equipment Requirements		
Lead test paper		
Fuel inlet gauge		
Emission control component manual		
Other equipment		
Repair Requirements	*Describe requirements*	
Grace period		
Catalyst replacement requirement		
Other part replacement requirements		
Catalyst replaced on inlet failure and on lead test failure		
Describe verification procedures for repairs		
Other Requirements		

ANTI-TAMPERING TEST PROCEDURES

The intent of this section is to describe the precise nature of the anti-tampering test procedures.

Equipment Requirements

Enter yes in the column labeled "Yes/No" if the item listed is used during the test procedure. Use the describe column to explain how and when the equipment is used and the specifications for the equipment (e.g., size and material requirements for fuel inlet gauge).

Repair Requirements

Enter yes in the column labeled "Yes/No" if the item listed is a program requirement. Use the describe column to explain how and when the requirement applies and other related details. Indicate whether specific parts (e.g., OEM parts) must be used for replacements.

I/M AUDIT QUESTIONNAIRE

Page Four

ANALYZER SPEC Computerized	**YES/NO**	**DESCRIBE** *spec, how it operates, & frequency*
Lockouts		
Warm-up time		
Leak check		
Calibration check		
HC hang-up		
Automatic Features		
Cutpoint selection		
Pass/Fail decision		
Calibration adjustment		
Test data collection		
Data loss problems Indicate magnitude and problems if known		
Q/C data collection		
Manual Analyzers		
Percent of data computerized for analysis		
BAR-74 or BAR-80 specification		

Other Details, Comments, or Problems:

ANALYZER SPECIFICATIONS

The intent of this section is to describe the features of the emission analyzers used in the program. There are separate sections for computerized equipment and manual analyzers.

Lockouts

Indicate whether the analyzers in use prevent official inspections until the items listed have been satisfied. This applies to computerized analyzers only. Also, indicate how often leak checks and calibration checks are required, the warm-up period and how and when HC hang-up is monitored.

Automatic Features

Indicate whether the items listed are automated or manual (at the inspector level). Describe the criteria used for the first three items. Describe the type of data collected, whether data loss has been a problem, the magnitude of data loss and the reasons for it (if known).

Manual Analyzers

Indicate the percent of manually collected data that is keypunched. Note the equipment specification requirement and, if possible, provide a list of approved analyzers.

I/M AUDIT QUESTIONNAIRE

Page Five

ANALYZER QC AND QA	*DESCRIBE*		
Service agreement requirements			
Gas naming of calibration & audit gases			
Station Gas Accuracy			
Concentration of station gases	PROPANE	CO	CO2
Cal check tolerances			
Station gas span frequency			
Audit gas accuracy			
Concentration of audit gases	PROPANE	CO	CO2
Audit tolerances			
Audit gas span frequency			

Additional features or comments:

ANALYZER QUALITY CONTROL AND QUALITY ASSURANCE

The intent of this section is to describe the quality control and quality assurance practices as they relate to the emission analyzers used in the program. Provide as much detail as possible about the types of gases, their accuracy, blend tolerance, naming protocol and about the tolerances for analyzer checks, and frequency of audits and spanning.

I/M AUDIT QUESTIONNAIRE

Page Six

INSPECTOR LICENSING	YES/NO	DESCRIBE
Training requirements:		
Analyzer use covered		
Emission related repairs		
Quality control		
Periodic recertification or other recertification required		
Number of licensed inspectors (date)		
Number of licensed stations (date)		

AUDIT PRACTICES	**DESCRIBE** *for past 12 months or most recent year available*	
Number of auditors (full-time equivalents)		
Audit frequency		
Total number of overt audits (give time period)		
Total number of covert audits (give time period)		
Number and model years of undercover vehicles used		
Are undercover cars set to fail (which tests)		

Describe covert and overt audit practices:

QUALITY ASSURANCE

The intent of this section is to describe the quality assurance practices used to license and monitor stations.

Inspector Licensing

Describe the features of the courses required of inspectors, including the source of the curricula used in training. Also, describe the recertification requirements both regular and otherwise (e.g., after suspension for violation).

Provide statistics for number of stations and inspectors (and the date for which these numbers are valid).

Audit Practices

In addition to the listed questions, briefly describe other details and procedures for both overt and covert audits. Attach a copy of any related procedures manuals, if available.

I/M AUDIT QUESTIONNAIRE

Page Seven

WAIVER PRACTICES	YES/NO	DESCRIBE
Cost limits (dollar amounts)		
Specific repairs required (list)		
Minimum emission reduction required (percentage)		
Tampering checks conducted (list)		
Warranty eligible vehicles excluded		
Repair documentation required		
Describe other waiver features:		

WAIVER PROCESSING

The intent of this section is to describe how and when waivers are issued to failed vehicles. In describing the listed items, indicate what the dollar amounts are, which items must be repaired, what percentage emission reduction is required, which emission control devices must be present and unaltered, how warranty issues are dealt with, and what documentation is necessary.

I/M AUDIT QUESTIONNAIRE

Page Eight

ENFORCEMENT	YES/NO	DESCRIBE
Sticker Enforcement		
Are all subject vehicles identifiable visually		
Is there a fine for driving without a valid sticker		
Is a grace period allowed after citation		
Is a court appearance required		
Is compliance required before case is closed		
List police agencies with enforcement authority		
Are sticker surveys conducted		
Are sticker numbers recorded on the test form		
Are different stickers used for new or exempt vehicles		
Can parked vehicles be ticketed if in violation		
Are roadside pullovers done to check stickers		

Comments:

STICKER ENFORCEMENT

The intent of this section is to describe the sticker enforcement mechanism, if used by the program. Describe when the listed items apply, how much the fines are, how long the grace periods, and other details associated with each question. Use the space below if addition room is needed.

I/M AUDIT QUESTIONNAIRE

Page Nine

ENFORCEMENT	YES/NO	DESCRIBE
Registration Enforcement		
Is guidance given to registrars on requirements		
Are audits conducted on registration documents		
How many subject vehicles register in non-I/M areas		
How many subject vehicles have expired registrations		
Data-Link Enforcement	DESCRIBE	
How many notices of violation have been sent		
How many vehicles responded to the notice		
How many enforcement actions have been taken		
How many vehicles responded to enforcement actions taken		
Time frame for results		

Additional Comments:

REGISTRATION ENFORCEMENT

The intent of this section is to describe the registration enforcement mechanism, if used by the program. In addition to the questions listed, describe any other problems, studies, data, or information relevant to the enforcement effort.

DATA LINK ENFORCEMENT

The intent of this section is to describe the data link or computer matching enforcement mechanism, if used by the program. In addition to the questions listed, describe in as much detail as possible the enforcment process, step by step. Also, discuss problems, studies, data, or information relevant to the enforcement effort.

I/M AUDIT QUESTIONNAIRE

Page Ten

EMISSION INSPECTION STATISTICS

MODEL YEAR	Number Vehicles Initially Tested	Number Failing Initial Test	Number Waived	Average Repair Cost
1968				
1969				
1970				
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978				
1979				
1980				
1981				
1982				
1983				
1984				
1985				
1986				
1987				
TOTAL				

EMISSION INSPECTION STATISTICS

For each model year covered by the program, list the combined number of light-duty cars and light-duty trucks that were initially tested during the reporting period, the number failing the initial emission test (only), the number waived and the average repair cost for failed vehicles. If repair cost can be broken out for waived vehicles vs. passes after maintenance, report these separately.

I/M AUDIT QUESTIONNAIRE

Page Eleven

ANTI-TAMPERING INSPECTION STATISTICS

	CATALYST Failures			FUEL INLET Failures			LEAD TEST Failures			PCV VALVE Failures			EVAP CANISTER Failures			AIR SYSTEM/PUMP Failures		
MODEL YEAR	# PASS	# FAIL	# NA	# PASS	# FAIL	# NA	# PASS	# FAIL	# NA	# PASS	# FAIL	# NA	# PASS	# FAIL	# NA	# PASS	# FAIL	# NA
1975																		
1976																		
1977																		
1978																		
1979																		
1980																		
1981																		
1982																		
1983																		
1984																		
1985																		
1986																		
1987																		
1988																		

Comments:

ANTI-TAMPERING INSPECTION STATISTICS

For each model year covered by the program (1975 and later), list the number of vehicles that passed the component checks, the number that failed and the number not originally equipped (or NA). If rates are not available by model year, use whatever model year groupings are available (e.g., 1981+, pre-1981; or all model years). Similarly, if rates are not available in the component breakouts provided, use component groupings available (e.g., catalyst/misfueling, underhood). Note in the comments section what the data listed include. Finally, if data cannot be broken into pass/fail/NA categories, explain on the comments section what the data provided include (e.g., pass includes NA).

I/M AUDIT QUESTIONNAIRE

Page Twelve

OVERT AUDIT STATISTICS	Number of Overt Audits	Number of Warnings	Number of Suspensions	Number of Revocations
Stations				
Inspectors				

Equipment Findings	Number of	Comments
Analyzers checked with audit gas		
Analyzers failing span check		
Leaks identified		
Stations missing anti-tampering equipment		

COVERT AUDIT STATISTICS	Number of Covert Audits	Number of Warnings	Number of Suspensions	Number of Revocations
Stations				
Inspectors				

ENFORCEMENT DATA	Number of vehicles	Comments
Required to be inspected in the reporting period		
Not complying with requirements		
Receiving citations or other enforcement		

Other Comments:

AUDIT STATISTICS

List the number of overt and covert audits conducted during the audit period. As a result of those audits, list the number of warnings, suspension, and revocations issued. If stations and inspector performance are not always checked or warned or penalized together, list the statistics separately.

For overt audits, list the results of analyzer audits (number checked and number failing.) Also, for ATP programs, list the number of stations that were missing equipment required for the anti-tampering check (e.g., inlet gauge, lead test paper, etc.).

ENFORCEMENT DATA

List the number of vehicles required to be inspected during the reporting period. Estimate the number not complying with requirements as best you can. Also the number of other enforcement actions taken. Describe how these statistics were determined.

I/M AUDIT QUESTIONNAIRE

Page Thirteen

COST DATA	Test fees	Comments
Emission/Tampering check only		
Safety test fee		
Combined fee		
Program Budget	Annual Dollar Amount	
Air agency		
I/M operations agency		
Enforcement agency		
Other government agencies involvod		
Government Staffing	Full-time Equivalents	
Number of station (QA) auditors		
Number of consumer assistance staff		
Number of administrative staff		
Number of enforcement staff		
Number of other staff		
Station/Program Staffing	Full-time Equivalents	
Number of inspection stations		
Number of inspectors		
Number of licensed mechanics		
Others (list)		

COST DATA

List the test fees in effect during the reporting period. For each agency involved in the inspection program, list the dollar amount allocated or actually spent on I/M - related activities.

Enter the number of people employed by the government agencies involved in the program for the various activities listed. If an auditor, for example, only spends half his or her time on the inspection program, count that as 0.5 persons.

For decentralized programs, list the numbers of stations, inspectors & mechanics involved in the program during the reporting period. For centralized program, list the number of government run stations, the number of government-employed inspectors, mechanics or other staff not listed in the government staffing section.

APPENDIX D

DESCRIPTIONS OF ON-SITE ACTIVITIES

1. Surveys
2. Records Review
3. Procedures Observations

DESCRIPTIONS OF ON-SITE AUDIT ACTIVITIES

1. Surveys

The activities denoted as surveys consist of information collection activities that involve the examination of vehicles and equipment. State or local cooperation and participation are generally necessary.

Enforcement Survey

In I/M programs with sticker enforcement (or with another form of enforcement but accompanied by a sticker which indicates compliance) a sticker survey must be performed. The purpose of the survey is to determine what percentage of subject vehicles are complying with the inspection requirement as indicated by a valid sticker, versus the percentage of vehicles without a sticker or with an expired sticker.

The survey should include a sample of at least 1000 randomly selected vehicles in each urbanized area. For practicality, it is acceptable to survey vehicles which are parked on-street, in paid off-street parking, or in free public lots such as at shopping centers. At least five widely spaced locations of several types in each urbanized area should be surveyed to get the sample of 1000 vehicles, to insure a reasonable cross-section. At least one location should be in the central business district.

The sticker survey offers a convenient opportunity to get a rough measure of the influence of non-subject (e.g., out-of-county) vehicles, since non-subject vehicles will have to be identified in the survey to avoid bias to the compliance rate estimate. Consequently, non-subject vehicles should be counted and recorded, rather than just passed by. If there are a significant number of non-subject vehicles operating in the I/M area, EPA may in the audit report recommend expansion of program boundaries or vehicle coverage.

The sticker survey is not intended to identify specific vehicles or owners for adverse action, so vehicle identifiers should not be recorded. The only exception would be when subject vehicles cannot be identified without a registration crosscheck (such as in a computer matching system) in which case license plates should be recorded for unstickered vehicles only.

A comprehensive investigation into compliance rates is not required in registration-enforced programs unless there is reason to suspect that registrations are being processed without required inspection documentation or program area vehicles are being registered elsewhere to avoid inspection. At a minimum, registration data should be compared with inspection volume data to determine whether a significant gap exists.

Data-linked enforcement programs should be investigated via records review to determine how many vehicles are at each stage of the enforcement sequence.

Tampering Survey

In programs with required inspections of some or all vehicles for tampering and misfueling and where additional emissions reduction credits are claimed for them in the SIP, a tampering survey must be performed. EPA has been conducting such surveys at various locations around the country each year and every effort has been made to conduct surveys in areas that are due for an audit. Tampering surveys are the only reliable method for determining the effectiveness of anti-tampering and misfueling programs.

Analyzer Audit, Centralized Programs

In centralized programs all of the active analyzers in at least three inspection stations should be audited. These audits may be performed by EPA personnel or by I/M program personnel. I/M program span gases can be used for analyzer checks, as long as it is verified that the gas is named properly.

In centralized programs with multiple urbanized areas, the site visit can be limited to one urbanized area (assuming there are at least three stations there), as long as one of the following conditions is met:

1. There are independent routine audits of all stations in the other urbanized areas conducted by an outside group or agency other than the one which performs routine calibration and maintenance, the results of these audits can be reviewed through records, and the EPA auditors have observed at least one audit by this outside group or agency, or
2. The same State/local personnel perform the routine calibration and maintenance in all urbanized areas.

Otherwise the EPA auditors must audit analyzers in additional urbanized areas, but not necessarily all of them.

An analyzer audit consists of a calibration check through the probe and a low flow indicator check. State/local and contractor cooperation will be needed to audit analyzers that are in service in open inspection lanes. Instructions and a recording form are found in Appendix F.

2. Records Review

In association with each of the following records reviews, the EPA auditors should seek an understanding of how the records are generated and handled by the I/M program. Where it seems useful and practical, copies of records should be requested, especially before the audit to allow in-office review.

Vehicle Records

Recent documentation (inspection forms, retest forms, repair forms or receipts, and waiver forms) must be reviewed from at least 500 vehicles. In a decentralized program, these records must come from at least ten different inspection stations. In centralized programs with computer-printed inspection forms, test records for passing vehicles need not be reviewed and the number of vehicles may be reduced accordingly. Care should be taken that the forms are from typical cases and that they have not been pre-screened before being provided to EPA.

The auditors should examine the forms for completeness, legibility, accurate application of inspection standards, reasonableness of the test scores, correct pass/fail determination, appropriateness of repairs, reductions in emission levels from repairs, and adequacy of documentation for a waiver if one was given. If severe deficiencies or repeated errors are noted for a licensed inspection station, the EPA auditors should ask to be allowed to review the records of past audits and of past and ongoing corrective action towards that station. Due to the limited amount of time available during an audit, bulk record reviews are more effective if conducted before the audit. This way more time can be spent studying the records and assessing problems. The results of an in-office review could lead the audit team to put more emphasis in some areas and less in others.

Station Audit Records, Centralized

EPA auditors should review the records created by the routine State or local audit of a few inspection lanes, to familiarize themselves with the procedures used by the auditors and the data available from their activities.

Station Audit Records, Decentralized

EPA auditors should review the audit records for each decentralized station visited during the audit. EPA auditors should look for audit completeness, adherence to procedures, and indications that inadequate performance by licensed stations is routinely identified and corrected. Instructions and a form are found in Appendix F. It is also worthwhile to review the records of stations that have been suspended or revoked to determine the incidence and causes of suspension or revocation.

Data Summaries

If the I/M program generates periodic data summaries not previously made available, these should be reviewed on site for the last few reporting periods. The manner in which the summaries are produced and the meaning of all entries should be understood.

Licensing/Suspension Records

Files relating to the disciplining of licensed inspection stations or fleets which do not adhere to procedures should be examined to determine the general nature of the State's or locality's practices in such cases.

Consumer Inquiries and Complaints

If the I/M program keeps such records, they can be scanned to determine the nature of such interactions with the public. These activities should be considered a low priority unless other audit findings suggest a need to review these records.

Enforcement Records

Statistics on recent and current enforcement activities should have been obtained during the audit preparation. While on-site, the EPA auditors should verify the enforcement procedures and general level of activity by reviewing records.

Other Records

Unique program features or earlier findings during the audit may suggest other records which should be reviewed.

3. Procedures Observation

Much of the on-site visit will consist of observing I/M officials or licensed inspectors perform their regular functions to determine if actual operations are consistent with the documented program design, questionnaire answers supplied by the I/M program, and good engineering and management practice. Suspicions raised by record reviews, surveys, and interviews may make it advisable to intensify the observation of procedures compared to the minimums suggested here.

Audits of Inspection Stations, Centralized

An audit of one centralized inspection station by program personnel should be observed. If no such audits are scheduled during the site visit, at least one special audit should be requested. The audit records of all auditing agencies should be reviewed for consistency of findings.

Audits of Inspection Stations, Decentralized

EPA auditors should accompany State or local officials as they visit licensed inspection stations on regular audits. The EPA auditors should observe how the State/local employees conduct the audit: whether written procedures are followed by the auditor, whether the auditor has the expertise to correctly respond to questions from the station personnel, and whether and how the auditor reacts to equipment defects or inspector performance problems. Auditors should observe at least one inspection at each station (requesting one if necessary) and examine any records being maintained by the station. Forms for observing audits are found in Appendix F. A total of 10-20 station audits divided among at least three program auditors should be observed by EPA.

In centralized programs with authorized self-inspecting fleets which together account for 5 percent or more of annual inspections, at least 3 fleet audits should be observed using the same procedures and form as for decentralized programs.

Inspections, Centralized

EPA staff should observe at least 30 inspections by centralized inspectors, not all at one station. These observations may be conveniently combined with the surveys of centralized analyzers. If heavy-duty vehicles are inspected at a separate location, several such inspections should be observed if time permits. Observations of inspections should include retests and waiver processing.

Waiver Processing

Where waivers are granted separately from the retest, EPA auditors should observe waivers being processed. To the extent practical, waiver processing should be observed at each location where it occurs.

Spot Checks Using Unmarked Cars

Most decentralized I/M programs conduct spot checks using unmarked cars at licensed inspection stations. Such checks, if they use vehicles adjusted to fail standards or component checks, can be a very important part of the program's quality assurance efforts. An EPA auditor should observe the procedures used first hand by accompanying a program official on a spot check. EPA should also determine what actions are taken when a station "fails" a spot check and how stations are selected for surveillance.

Other Procedures

Other activities should be observed as necessary. For example, where questionnaire answers or records review indicates a shortfall of vehicle inspections in a registration enforced system, it is recommended that the registration renewal process be observed.

APPENDIX E

PROCEDURES USED IN OMS TAMPERING SURVEYS

PROCUREMENT ABSTRACT

Motor vehicles and motor vehicle engines sold in the United States are required to be covered by a Certificate of Conformity which is issued to manufacturers who have demonstrated that their vehicles and engines can meet the emissions standards established under the Clean Air Act (Act). Most new vehicles are certified to use unleaded gasoline to protect emissions control systems. Section 203(a)(3) of the Act prohibits manufacturers, dealers, fleet operators, or anyone in the business of selling, servicing, leasing, repairing, or trading motor vehicles from tampering with emissions control devices and systems. Regulations promulgated pursuant to the Act prohibit the introduction of leaded fuel into vehicles requiring unleaded fuel. EPA is aware that tampering and fuel switching do occur. The Field Operations and Support Division of EPA is responsible for enforcement of these laws.

Each year EPA conducts national tampering and fuel switching surveys. These surveys are used by EPA for measuring the rate of tampering and fuel switching. The results of the surveys are used to direct policy actions and to determine the effectiveness of ongoing programs. One such program is the field office operation of the Field Operations and Support Division. These offices investigate and prosecute acts of tampering and fuel switching. Additionally, state governments utilize these data and results in order to evaluate, develop, and implement State and local antitampering and anti-fuel switching programs.

For the 1988 survey EPA wishes to have a contractor coordinate, collect, and compile the data for EPA's 1988 report. The period of performance for completing work shall be one year with options for two additional years. The contractor must have personnel with extensive experience in automotive emission controls and in detecting emission control tampering and fuel switching, be familar with past surveys since the methodology must be consistent with those surveys, and have the ability to enter and edit the data in a machine readable format. The contractor must not have any interests which could affect the impartiality of the data.

8. The Contractor shall conduct the underhood examination, fuel sampling, emissions test, plumbtesmo test, exhaust system examination, and fuel inlet restrictor examination, and record the required information for each vehicle.

9. Contractor shall label all fuel samples so as to be identified with a particular vehicle, pack samples as required by applicable D.O.T. Federal regulations pertinent to shipping of gasoline samples, and ship the samples in strict accordance with the Technical Proposal Instructions by a method approved by the EPA Project Officer no later than one week after sampling to EPA's laboratory at the Motor Vehicle Emissions Laboratory (MVEL) in Ann Arbor, Michigan, for testing by EPA. The results will be supplied to the contractor within sixty (60) days from the receipt of the samples at MVEL.

10. Contractor shall edit the data from all vehicles surveyed and compile the raw data in an account specified by the Project Officer on EPA's IBM computer system. The raw data shall be accessible on EPA's computer system no later than 2 months after the end of the survey and the delivery of the fuel sample results to the contractor. The contractor shall also deliver to the EPA copies of the daily calibration logs for the exhaust gas analyzer(s) and copies of the data forms for every vehicle surveyed within thirty (30) days after each survey site is completed.

11. Duplicate fuel samples shall be taken every twenty samples and shipped with original samples to EPA's laboratory (MVEL) for analysis. Samples of the gas used to flush the fuel pump and line will also be taken whenever new wash gas is obtained.

EPA representatives will also do a background report for each site which will include the exact situation in which vehicles were procured, a geographical description of the site, weather, and other circumstances that might affect refusals, who the inspectors are on a particular site, how many and which observations were made at each site, and other circumstances that might bear upon the representativeness of the data. The contractor personnel will perform the actual vehicle inspections, and be responsible for filling out the raw data forms.

II. Suggested Equipment

2 - HC-CO gas analyzers with sample lines, water trap and tailpipe probe

1 - Calibration Gas ± 2% of listed concentration Nominal

8% CO
1560 ppm HC (Hexane equivalent)

1.6% CO
320 ppm HC (Hexane equivalent)

1 - Field kit for testing lead in gasoline

3 - Inspection Mirrors

1 - Large long-handled mirror for exhaust system inspection

2 - Flashlights

2 - Vacuum Pumps

2 - Fender Covers

2 - Fuel Sampling Pumps with 4 ft hoses

500 - Sample Bottles per site

1 - Gasoline-powered generator for sites without power

1 pair - Battery Jumper Cables

2 - Leaded nozzles

DATA COLLECTION AND RECORDING PROCEDURES

The forms on the following pages (Figures A-1 and A-2) will be used to record the survey data in the field. Minor revisions may be made to these forms by the Project Officer prior to the start of the surveys. The forms are forced choice to ensure coding consistency, and are designed to facilitate direct data entry. The following codes will be used to record data for the major system components on the data sheets:

0 - Not originally equipped

1 - Functioning properly

2 - Electrical disconnect

3 - Vacuum disconnect

4 - Mechanical disconnect

5 - Incorrectly routed hose

6 - Disconnect/Modification

7 - Missing item

8 - Misadjusted item

9 - Malfunctioning

A - Stock equipment

B - Non-stock

D - Add on equipment

Y - Yes

Z - No

Additional codes can be used for those components which could not be classified into the above categories. A brief description of each data entry follows.

1986 TAMPERING SURVEY - PART B (REAR)

1 ☐☐☐☐ 4 **ID NUMBER**

5 ☐☐☐☐ 8 **MAKE** (write out)

9 ☐☐☐☐ 12 **MODEL** (write out)

13 **VEHICLE TYPE**

☐
- C- Car
- T- Truck (includes vans)

14 ☐☐ 15 **LICENSE PLATE** (State)

16 ☐☐☐☐ 19 **IDLE HC** (PPM)

20 ☐☐.☐ 22 **IDLE CO** (%)

23 ☐☐☐ 25 **ODOMETER** (Thou.)

26 **DASH LABEL**

☐
- 0- Not orig. equipped
- 1- Funct. properly (present)
- 7- Missing item

27 **CATALYTIC CONVERTER**

☐
- 0- Not orig. equipped
- 1- Funct. properly (present)
- 7- Missing item

28 **EXHAUST SYSTEM**

☐
- A- Stock
- B- Non-Stock

29 **EXHAUST SYSTEM INTEGRITY**

☐
- 1- Funct. properly (no obvious leaks)
- 9- Malfunctioning (leaks evident)

30 **TANK CAP**

☐
- 1- Funct. properly
- 7- Missing item
- 9- Malfunctioning (loose or unsealed)

31 **TANK LABEL**

☐
- 0- Not orig. equipped
- 1- Funct. properly (present)
- 7- Missing item

32 **FILLER NECK RESTRICTOR**

☐
- 0- Not orig. equipped
- 1- Funct. properly
- 4- Mech. disc. (widened)
- 7- Missing item

33 **PLUMBTESMO**

☐
- P- Positive
- N- Negative

34 **FUEL SAMPLE**

☐
- Y- Yes
- Z- No

---

leave blank

35 ☐☐☐☐ 38 **FUEL DATA**

4 - Mechanical disconnect - When the stovepipe is disconnected or deteriorated. Also when the air cleaner has been unsealed, i.e., inverted air cleaner lid, oversized filter element, or holes punched into air cleaner.

7 - Missing item - Missing stovepipe hose.

9 - Malfunctioning item - Problems with the vacuum override motor.

B - Non-stock equipment - Custom air cleaner.

j. Positive Crankcase Ventilation (PCV) system - A typical configuration for a V-8 engine consists of the PCV valve connected to a valve cover and then connected to the carburetor by vacuum line. The other part of the system has a fresh air tube running from the air cleaner to the other valve cover. The PCV will be coded as follows:

1 - Functioning properly

3 - Vacuum disconnect - When the line between the PCV and the carburetor is disconnected.

4 - Mechanical disconnect - When the fresh air tube between the valve cover and the air cleaner is disconnected or removed.

7 - Missing item - When the entire system has been removed.

9 - Malfunctioning item - When the line between the PCV and the carburetor is cracked or collapsed.

B - Non-stock - When the fuel economy device is installed in PCV line.

k. Turbocharger - Will be coded '0', 'A', 'B', or 'D'.

l. Evaporative Control System (ECS) - Controls vapors from the fuel tank and carburetor. Some systems have two lines, one from the fuel tank to the canister, and one from the canister to the carburetor or air cleaner to air purge the canister. The ECS will be coded as follows:

n. Air Pump Belt

0 - Not originally equipped (if an aspirated system or none)

1 - Functioning properly

7 - Missing item

8 - Misadjusted item - Loose pump belt

o. Air Pump

0 - Not originally equipped (if an aspirated system or none)

1 - Functioning properly

4 - Mechanical disconnect (other than belt removal)

7 - Missing item

9 - Malfunctioning - Frozen pump

p. Exhaust Mainfold - will be coded 'A' (stock) or 'B' (non-stock).

q. Oxygen Sensor - Controls the air-fuel mixture going into the engine of vehicles equipped with three-way catalytic converters. The sensor will be coded '0', '1', '2', '4' (sensor unscrewed), or '7'.

r. Carburetor Type - An 'A' is used to indicate that the carburetor is a production unit (non-sealed original equipment). If the carburetor is a sealed unit (without limiter caps), an 'S' is recorded. If fuel injection is used, then an 'F' is recorded. If the carburetor has been replaced with a non-stock unit, then a 'B' is recorded.

s. Limiter Caps - Plastic caps on idle mixture screws designed to limit carburetor adjustments. Sealed plugs are also considered a type of limiter cap. Limiter caps will be coded as follows:

0 - Not originally equipped (fuel injected vehicle)

1 - Functioning properly

4 - Mechanical disconnect - Tab broken or bent

Form B - Rear

a. ID Number - Same as on Form A.

b. Make

c. Model

d. Vehicle Type - coded as follows: C = car, T = truck

e. License Plate - State abbreviation

f. Exhaust gas HC concentration (in ppm) at curb idle.

g. Exhaust gas CO concentration (in percent) at curb idle.

h. Odometer - record mileage in thousands

i. Dash Label - displays the fuel required and shall be coded '0', '1', or '7'.

j. Catalytic Converter - oxidizes the HC and CO to water and CO_2 in the exhaust gas. Later model catalysts also reduce oxides of nitrogen. The converter shall be coded '0', '1', or '7' (entire catalyst canister removed).

k. Exhaust System - if as originally equipped an 'A' shall be coded. If non-stock a 'B' shall be coded.

l. Exhaust System Integrity - the condition of the exhaust system shall be coded '1' (no obvious leaks) or '9' (leaks evident). An exhaust system will apparent leaks will invalidate the idle emissions readings.

m. Tank Cap - seals the fuel tank during normal operating conditions and shall be coded '1', '7', or '9' (loose cap).

n. Tank Label - displays required fuel and is coded '0', '1', or '7'.

o. Filler Neck Inlet Restrictor - The restrictor is designed to prevent the introduction of leaded fuel into a vehicle requiring unleaded fuel. It shall be coded '0' (leaded vehicle only), '1', '4' (widened or cheater device present), or '7'.

FUEL SAMPLE COLLECTION AND LABELING PROCEDURES

A fuel sample shall be taken from each vehicle requiring unleaded fuel. These samples shall be collected in 4 ounce glass bottles with a hand fuel pump. Once the sample is drawn, the fuel shall be replaced with an equivalent amount of unleaded fuel if the driver requests, and the pump shall be flushed with unleaded fuel.

Each bottle shall be identified with a stick-on label that has the vehicle identifying survey number on it. The vehicle identifying survey number is the first entry on the data forms described in Attachment A.

Prior to shipment from the field, a sample tag with the same identifying number shall be attached to each bottle. The bottles will be packaged, labeled, and shipped to the Chemistry Laboratory at EPA's Motor Vehicle Emissions Laboratory in Ann Arbor, Michigan, according the shipper's requirements. The contractor shall use screw-on caps on all sample bottles, having either teflon or polyethylene cap liners. The contractor shall assure that all sample bottles are capped securely to prevent any leakage and/or contamination.

EMISSIONS SAMPLING OF HC AND CO

Vehicles are tested in as-received condition with the engine at normal operating temperature. With engine idling and transmission in neutral, the sample probe is inserted into the tailpipe. Exhaust concentrations are recorded after stabilized readings are obtained or at the end of 30 seconds, whichever occurs first. The process is repeated as necessary for multiple exhaust pipes. However, multiple readings are not necessary for exhaust originating from a common point. Results from multiple exhaust pipes are to be numerically averaged. Results are then recorded on the form for the vehicle being sampled.

APPENDIX F

INSTRUCTIONS AND FORMS FOR AUDIT ACTIVITIES

AUDITOR PERFORMANCE EVALUATION FORM

Program Auditor

RECORD REVIEW	YES/NO	COMMENTS
Test records reviewed		
Sticker inventory made		
QC records reviewed		
Problems found by auditor		
Was feedback given		
EQUIPMENT INSPECTION		
Gas bottle checked		
Gas audit conducted		
Tolerances applied		
Inlet gauge measured		
Lead test paper checked		
Required manuals checked		
Problems found by auditor		
Feedback given		
VEHICLE INSPECTION		
Test observed		
Rating form used		
Problems found by auditor		
Feedback given		

ADDITIONAL OBSERVATIONS

OBSERVING AUDITS OF INSPECTION STATIONS

Background

The purpose of the audit observation is to determine whether actual audits are consistent with requirements and based on good engineering and management practices. In centralized programs, at least one audit by a State/local program auditor must be observed. In decentralized programs, most station visits should allow for observation of the regular audit practice. EPA auditors should first observe the State/local personnel as they are performing their audits with as little interference as possible. After the audit is completed, or while activities not necessary to observe are underway, EPA auditors may commence their audit functions.

Instructions

This form covers three basic audit functions that should be completed by the program auditor. Each function has activities associated with it and the EPA auditor should determine whether the program auditor accomplished these activities and how well. In particular, the EPA auditors should note how the program auditor deals with problems found. In centralized programs, the record review and vehicle inspection sections may not be applicable. Be sure to note the name of the auditor and the station in which the audit occurred.

CENTRALIZED STATION CALIBRATION CHECK RESULTS

Auditor ____________ Date ____________

STATION	LANE	ANALYZER	PEF	HC HANGUP	LOW FLOW		READINGS		HC RANGE			CO P/F
					Before	After	HC	CO	+5%	-7%	P/F	-

ANALYZER AUDITS OF CENTRALIZED FACILITIES

Instructions

The objective of analyzer audits is to determine whether accurate readings are being obtained in normal testing (i.e., through the probe). Therefore, analyzer audits involve introducing span gases of known concentration into the analyzer through the probe in order to simulate an actual I/M test.

The report for the analyzer audits should summarize the number of analyzers which were audited, the number passing all checks, and the number failing to meet tolerances and why. The report should also indicate what action was taken by program officials for problem analyzers, i.e., no action, taken out of service, or repaired on the spot. If the latter, the repaired analyzers should be rechecked during the audit to verify their accuracy after repair.

Equipment Needed

1) Span gases - Low range span gas (nominally 1.6% CO, 600 ppm propane, balance N_2); all span gases must be traceable ±1% to NBS standards; gas analysis must be performed by EPA or using EPA-approved protocol.

2) Cylinder gauges and flow regulator.

3) Hardware to flow gas through the probe, commonly referred to as a "tailpipe simulator."

4) Calculator; balloons; hand tools.

Audit Procedure

1) Analyzers must be warmed up and ready for testing.
2) Record station, lane, analyzer number, and PEF.
3) If not automatic, check/adjust zero and electric span.
4) Check the hangup; purge until less than 20 ppm; record final HC hangup value; recheck zero and electrical span.
5) Insert probe into tailpipe simulator for low flow indication; if passed, record "ok" and proceed.
6) Flow span gas through probe; enter HC and CO readings when stabilized (i.e., obtain maximum values); close valve.
7) Verify final low flow; record "ok" if passed; remove probe.
8) Adjust HC reading for HC hangup. Adjust propane span gas concentration using PEF and calculate the acceptable HC range. Enter the results and compare with adjusted HC reading. If within the range (or ± 15 ppm HC, whichever is greater), HC channel passes. Indicate HC P/F.
9) Enter the allowable CO range in the top of the last column (+5% and -7% of the CO span gas value). If CO reading is within the range (or ±0.1% CO, whichever is greater), CO channel passes. Indicate CO P/F.

INSPECTION OBSERVATION FORM

Inspector		*Station ID*	
Vehicle Identifcation Info			
INSPECTION AUDIT		Comments	
EMISSION TEST	YES/NO		
Checked for exhaust leaks			
Checked for vehicle warm			
Turned accessories off			
Probe insertion okay			
RPM limits maintained			
Preconditioning done			
Preconditioning time		# seconds	
Test time		# seconds	
	HC	CO	
Test results observed			
Test results recorded			
TAMPERING CHECK	YES/NO	P/F/NA	
Catalyst			
Fuel inlet restrictor			
Inlet gauge used			
Lead test			
PCV			
Air pump			
Evaporative canister			
Others (list)			

INSPECTION OBSERVATION

Background

The purpose of observing inspections is to determine whether they are being conducted according to procedure. At least one inspection should be observed in each decentralized station visited and as time allows in centralized stations.

Instructions

The form covers both the emission test and emission control component checks. Most of the form has the format of a questionnaire, indicate yes or no answers as appropriate for each item that applies or not applicable for those that do not. Use the comments section to describe deviations from procedure or other problems observed. Use a watch that shows time in seconds and monitior test and preconditioning times. When manual analyzers are in use, observe emission readings and record the results. Also enter the readings recorded by the inspector.

Ideally, observe a re-inspection of a vehicle that is at the station and was inspected earlier in the day. If such a vehicle is not available, observe an inspection of a vehilce in for an official inspection. At last resort, request an unofficial inspection of any vehicle available. For the emission control component inspection, request that the inspector verbally and physically identify underhood components.

ANTI-TAMPERING STATION AND INSPECTION OBSERVATION FORM

Inspector

Station ID

Vehicle Identifcation Info

EQUIPMENT CHECK	YES/NO	Comments
Lead Test		
Paper Active		
Paper Plentiful		
Spray Bottle		
Degreasing Rag		
Fuel Inlet Gauge		
Present		
Proper Size		
Underhood Checks		
Manuals Present		
Other Equipment		
Other Requirements		
Stickers/Forms		
Log Book		
Sign		
Lighting		

TAMPERING CHECK	YES/NO	P/F/NA	
Catalyst			
Fuel inlet restrictor			
Inlet gauge used			
Lead test			
PCV			
Air pump			
Evaporative canister			
Others (list)			

ANTI-TAMPERING ONLY INSPECTION OBSERVATION

Background

The purpose of observing inspections is to determine whether they are being conducted according to procedure. At least one inspection should be observed in each decentralized station visited and as time allows in centralized stations.

Instructions

The form covers only the emission control component checks. Most of the form has the format of a questionnaire, indicate yes or no answers as appropriate for each item that applies or not applicable for those that do not. Use the comments section to describe deviations from procedure or other problems observed. Be sure to note the results that the inspector derives for each component checked.

Ideally, observe a re-inspection of a vehicle that is at the station and was inspected earlier in the day. If such a vehicle is not available, observe an inspection of a vehilce in for an official inspection. At last resort, request an unofficial inspection of any vehicle available. For the emission control component inspection, request that the inspector verbally and physically identify underhood components.

RECORDS REVIEW

Location

Program Auditor

INSPECTION RECORDS

Criterion	Poor	Fair	Good	Excel	Comments
Completion					
Legibility					
Accuracy					
Form Adequacy					
Component Choice					
Cutpoint Selection					
Pass/Fail Decision					

WAIVER RECORDS

Criterion	Poor	Fair	Good	Excel	Comments
Completion					
Legibility					
Accuracy					
Form Adequacy					
Criteria Met					
Documentation					

QUALITY CONTROL RECORDS

Criterion	Poor	Fair	Good	Excel	Comments
Completion					
Legibility					
Accuracy					
Form Adequacy					
QC/QA Frequency	R	S	U	A	
Weekly cal check					
Cal check "pass"					
Tolerances correct					
Weekly leak check					
Leak check "pass"					
QA check period					
Audit cal "pass"					
Audit leak "pass"					

Key: R = Rarely, S = Sometimes, U = Usually, A = Always

RECORD REVIEW

Background

The primary purpose of reviewing records is to determine whether program data are being collected properly and completely. This form provides for review of three basic types of records: inspection records, waiver records, and quality control records.

General Instructions

Review records keeping in mind the criteria listed on the form; common to all record review is the need to assess whether the forms are filled in completely, legibly, accurately and whether the form itself is adequate. There is space available for additional criteria pertinent to the particular program being audited. Make notes in the comments section on problems found and afterwards make overall judgments on each of the criteria.

Depending on the systems used in the program, some records may be collected through the use of computers and it may be difficult or unnecessary to make judgment on some of the criteria (e.g., legibility). In decentralized programs, records review should take place in each station visited, and may also be done in bulk before or after the audit.

Inspection Records

Inspection records should be reviewed to determine whether test procedures are being properly followed. In particular, a determination should be made as to whether inspectors are applying the correct emission standards, checking for the applicable emission control components, and filling out forms correctly.

Waiver Records

Waiver records should be reviewed to determine whether waivers are being properly issued. A determination should be made as to whether waived vehicles meet all applicable criteria and whether sufficient documentation is included to verify this.

Quality Control Records

In addition to the basic review, quality control records should be reviewed to determine the frequency and results of various quality assurance and quality control actions. Generally, weekly calibration and leak checks must be done and, in decentralized programs, either monthly or quarterly audits are required.

DECENTRALIZED INSPECTION STATION ANALYZER AUDIT FORM

Program Auditor	***Inspector Name***
Station Name	***Station Number***

STATION SPAN	YES/NO	COMMENTS
Hangup checked		
Zero/span done		
Leak check done		
Data entered properly		

	H C	DEVIATION	CO	DEVIATION
Bottle values				
Span results				

VISUAL INSPECTION	GOOD/BAD	*STATION GAS DATA*	
Sample Line/Probe		Blend Tolerance	
Filter/Water trap		Accuracy Spec	
General Condition		Name of Gas Supplier	
CO2 Lockout		COMMENTS	
Leak Lockout			
Calibration Lockout			

EPA GAS SPAN				
HC Hangup	ppm			
PEF				
Probe	H C	DEVIATION	CO	DEVIATION
Other	H C	DEVIATION	CO	DEVIATION

ADDITIONAL COMMENTS

DECENTRALIZED STATION ANALYZER AUDIT FORM

Background

The objective of analyzer audits is to determine whether accurate readings are being obtained in normal testing (i.e., through the probe). Therefore, analyzer audits involve introducing span gases of known concentration into the analyzer through the probe in order to simulate an actual I/M test.

Instructions

This form provides space for the results of the regular analyzer audit conducted by the station owner or the program auditor, and for the results of the EPA analyzer audit. In observing the station inspector or the program auditor check the analyzer, note the procedure used and the results. In addition, the form provides space for noting the condition of the analyzer and type and concentration of calibration gases in the station. The form also has space to note the effectiveness of lockouts. A simple procedure to check the lockouts on computerized analyzers is as follows:

1) Conduct an official test and sample room air to trigger the CO_2 lockout. The CO_2 lockout should result in an invalid test.

2) Conduct a leak check without capping the probe, then attempt to conduct an official inspection. The lockout should prevent an official inspection.

3) Disconnect the calibration gas line and conduct a "weekly" calibration check using room air, then attempt an official inspection. The lockout should prevent an official inspection.

APPENDIX G

CHECKLIST FOR COMPLETING THE I/M AUDIT

G-1-a

CHECKLIST FOR COMPLETING THE I/M AUDIT

I. Advance Preparation

A. Documentation Assembly

- ____ Review applicable portions of SIP
    - ____ Enabling legislation
    - ____ Program rules and regulations
    - ____ Other technical or procedural information

- ____ Review other SIP related information
    - ____ EPA rulemakings
    - ____ EPA Technical Support Documents
    - ____ EPA Tampering Surveys

- ____ Review other program documents
    - ____ Operating contracts
    - ____ Procedures manuals (testing, quality control, etc.)
    - ____ Analyzer specifications
    - ____ Quality assurance plan

- ____ Review available reports on program operations
    - ____ Periodic reports published by I/M agency
    - ____ Reports on previous audits
    - ____ Reports on special surveys or projects
    - ____ Data summaries obtained from I/M agency

- ____ Review recent correspondence

B. Program Questionnaire

- ____ Review program design
    - ____ Vehicle coverage
    - ____ Cutpoints
    - ____ Test procedures
    - ____ Analyzer specifications
    - ____ Analyzer maintenance and calibration
    - ____ Station and inspector licensing
    - ____ Record keeping at time of inspection
    - ____ Audit/surveillance activities
    - ____ Challenge mechanism
    - ____ Repair waivers
    - ____ Enforcement mechanism
    - ____ Mechanics training and other interface
    - ____ Consumer issues
    - ____ Self assessment through data analysis
    - ____ Future plans

____ Review operating experiences
    ____ Operating statistics
    ____ Quality control statistics
    ____ Data analyses
    ____ Consumer protection
    ____ Repair waivers
    ____ Enforcement
    ____ Mechanics training and other interface
    ____ Self assessment through data analysis

C. Notice to Program Officials and Other Affected Parties

____ Send formal notice to State/local agencies 60 days in advance of site visit
____ Send blank questionnaire to program officials for completion and return before site visit
____ Notify all concerned EPA offices of audit

II. On-Site Audit Visit

A. Initial interviews

____ Air planning agency officials
____ I/M operating agency officials

B. Review of program records

____ Inspection records
____ Enforcement records
____ Waiver records
____ Audit/surveillance records
____ Repair records

C. Inspection station visits

____ Observation of program auditors
____ Analyzer checks
____ Observation of waiver processing
____ Interviews of station personnel
____ Record checks
____ Observation of inspections

D. Special surveys and interviews

____ Enforcement surveys
____ Idle test surveys
____ Tampering/misfueling surveys
____ Interviews of non-program representatives with special knowledge/experiences

E. Exit interview

____ Review of audit activities
____ Feedback on audit
____ Discussion of preliminary audit findings
____ Plans for audit report
____ Requests for additional materials needed by EPA
____ Follow-up activities by EPA

III. Audit Report

____ Receive FOSD trip report
____ Receive ECTD trip report
____ Assemble draft audit report
____ Send draft to FOSD and ECTD for review
____ Incorporate FOSD and ECTD comments
____ Send final draft to program agencies for comment
____ Finalize audit report; final (initial) audit report shall contain:

    ____ Background description of program
    ____ Review of audit activities
    ____ Discussion of program strengths
    ____ Discussion of program weaknesses
    ____ EPA recommendations for correcting problems
    ____ Description of any follow-up activities, if needed
    ____ Discussion of State/local commitments subsequent to the audit to resolve any identified problems
    ____ State/local comments on draft report shall be appended to the final report
    ____ Completed audit questionnaire shall be appended to the final report